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Ecuadorian Lizards of the Genus *Stenocercus* (Squamata: Tropiduridae)

By

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ABSTRACT A taxonomic review of lizards of the genus *Stenocercus* in Ecuador revealed that coloration and certain external morphological characters, such as scales around midbody, the relation between tail length and total length, and number of subdigital lamellae on Finger IV are important taxonomic characters. Fourteen species, including two species new to science are recognized: *Stenocercus aculeatus*, *S. angel* sp. nov., *S. carrioni*, *S. chota* sp. nov., *S. festae*, *S. guentheri*, *S. haenschi*, *S. humeralis*, *S. iridescens*, *S. limitaris*, *S. ornatus*, *S. rhodomelas*, *S. simonsii*, and *S. varius*. Of the new species, *Stenocercus angel* occurs at elevations of 3015–3560 m in Provincia Carchi and Provincia Sucumbíos, and *Stenocercus chota* occurs at elevations of 1575–1940 m in the Chota Valley, Provincia Imbabura. All species are redescribed, except for *Stenocercus carrioni*, *S. limitaris*, and *S. simonsii*, which have recent and appro-

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priate complete descriptions. A neotype for *S. festae* is proposed. Sexual variation in morphological characters is described for all species, along with geographical variation in *S. guentheri, S. iridescens,* and *S. varius*. The distribution of each species is mapped, and new color descriptions and ecological and reproductive data are provided. A dichotomous key is also included to assist in the identification of specimens.

Key words: Tropiduridae, *Stenocercus*, Ecuador, Taxonomy, Ecology, Distribution.

RESUMEN Una revisión taxonómica de las lagartijas del género *Stenocercus* del Ecuador reveló que la coloración y ciertos caracteres de morfología externa, tales como el número de escamas alrededor del medio cuerpo, la relación entre la longitud de la cola y la longitud total y el número de lamelas del cuarto dedo de la mano son caracteres taxonómicos importantes. Se reconocen 14 especies, incluyendo dos nuevas para la ciencia: *Stenocercus aculeatus, S. angel* sp. nov., *S. carrioni, S. chota* sp. nov., *S. festae, S. guentheri, S. haenschi, S. humeralis, S. iridescens, S. limitaris, S. ornatus, S. rhodomelas, S. simonsii* y *S. varius*. De las especies nuevas, *Stenocercus angel* habita entre los 3015 y 3560 m en las provincias de Carchi y Sucumbíos, y *Stenocercus chota* habita en el valle del Chota, provincia de Imbabura, entre los 1575 y 1940 m. Todas las especies fueron redescritas, excepto *S. carrioni, S. limitaris* y *S. simonsii*, las cuales cuentan con descripciones recientes y apropiadas. Se propone un neotipo para *S. festae*. También se indica la variación sexual de los caracteres morfológicos para todas las especies y la variación geográfica para *S. guentheri, S. iridescens* y *S. varius*. Se presentan mapas de distribución para todas las especies y se proveen nuevos datos ecológicos y reproductivos, así como nuevas descripciones de color. También se incluye una clave dicotómica para ayudar en la identificación de los especímenes.

Palabras claves: Tropiduridae, *Stenocercus*, Ecuador, Taxonomía, Ecología, Distribución.

INTRODUCTION

Tropiduridae is a family of medium-sized Neotropical iguanian lizards composed of nine genera (Frost, 1992). *Stenocercus* Duméril and Bibron (1837) occurs in western South America from northern Colombia to northern coastal Argentina. These lizards occur in a variety of habitats: dry and humid tropical forests, montane forests, and paramo, at elevations of 0–4000 m. The phylogeny of *Stenocercus* has not been studied because several alpha-taxonomic problems have been pending. Fritts (1974) briefly characterized 29 species and reported nine species for Ecuador. Cadle (1991) provided amended descriptions of two Ecuadorian species (*S. simonsii* and *S. carrioni*). He also described *S. limitaris* (Cadle, 1998). Because little has been done to resolve the taxonomic problems of the Ecuadorian members of this group, specimens in several collections have remained unidentified or have been misidentified. The objective of this study is to provide a better understanding of the diversity of this group of lizards in Ecuador.

HISTORICAL SUMMARY

Thirty-one percent of the species of *Stenocercus* were described in the last three decades (Ayala and Castro, 1982; Cadle, 1991, 1998; Corredor, 1983; Fritts, 1972). Gray (1845) provided the first description of *Stenocercus* from Ecuador (*Leiocephalus ornatus*). Most Ecuadorian species of *Stenocercus* were described in the second half of the Nineteenth Century. *Liocephalus iridescens* and *Microphractus humeralis* were described by Günther (1859a, b), and *Leiocephalus aculeatus* by O'Shaughnessy (1879); these descriptions were based on collections made by Roff deposited in the British Museum (Natural History). Specimens from subsequent collections deposited in the British Museum by explorers and naturalists (Brenchley, Fraser, Buckley, and Simons) were described by Boulenger (1885, 1899) as *L. guentheri, L. rhodomelas, S. varius*, and *S. simonsii*. *Liocephalus festae* was described by Peracca (1897), and *L. haenschi* by Werner (1901); the latter description was based on material collected by Richard Haensch and deposited in the Zoologisches Museum of Berlin. The description of *S. carrioni* (Parker, 1934) is based on specimens deposited in the British Museum from Provincia Loja and Provincia Zamora by Carrión. After a hiatus of 40 years, during which there were no noteworthy contributions to our knowledge of *Stenocercus* in Ecuador, Fritts (1974) published a brief characterization of nine species of Ecuadorian *Stenocercus*.

Of the 12 Ecuadorian species of *Stenocercus*, only four (*S. carrioni, limitaris, simonsii*, and *varius*) were described originally as members of this genus. *Stenocercus humeralis* was described as *Microphractus humeralis*, and the remaining species (*S. aculeatus, festae, guentheri, haenschi, iridescens, ornatus*, and *rhodomelas*) were placed originally in *Leiocephalus*. The latter genus was erected by Gray (1827) and often has been misspelled as *Liocephalus*. Etheridge (1966) distinguished South American from West Indian species of *Leiocephalus* and allocated the South American species to the genus *Ophryoessoides*. He acknowledged the

likely association of some species of *Ophryoessoides* with *Stenocercus*. Fritts (1974) redefined the genera *Ophryoessoides* and *Stenocercus*. Frost and Etheridge (1989) placed *Stenocercus* in the family Tropiduridae. In his phylogenetic analysis of the Tropidurinae, Frost (1992) proposed that *Ophryoessoides* and *Proctotretus* should be placed in synonymy with *Stenocercus*, which he placed in a new tribe, Stenocercini.

Four species, *Stenocercus boettgeri*, *S. erythrogaster*, *S. formosus*, and *S. ornatissimus* were erroneously considered to occur in Ecuador (Almendáriz, 1992; Miyata, 1982; Peters, 1967; Peters and Donoso-Barros, 1970). *Stenocercus boettgeri*, *S. formosus*, and *S. ornatissimus* occur only in Peru (Fritts, 1974). *Stenocercus erythrogaster* is known only from northern Colombia (Peters and Donoso-Barros, 1970).

The objectives of my work with Ecuadorian *Stenocercus* are to (1) describe two new taxa, (2) redescribe poorly known species, and (3) add new data on the morphology, biology, ecology, and distribution of all species.

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MATERIALS AND METHODS

All of the specimens examined in the course of this study are listed in the Appendix. Throughout the text and appendix, the specimens are listed with their catalog numbers, preceded by the following codes: BM = British Museum (Natural History); EPN = Escuela Politécnica Nacional, Quito, Ecuador; FHGO = Fundación Herpetológica Gustavo Orcés, Quito, Ecuador; KU = Natural History Museum, The University of Kansas; MRHN = Institut Royal des Sciences Naturelles de Belgique, Brussels; MZUT = Museo Regionale di Scienze Naturali, Torino; QCAZ = Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito; SMF = Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany; UDAR = Museo de la Universidad del Azuay, Cuenca, Ecuador; USNM = Smithsonian Institution, National Museum of Natural History; ZMB = Universität Humboldt, Zoologisches Museum, Berlin.

Measurements were made with calipers and recorded to the nearest 0.1 mm with the exception of the snout-vent length (SVL) and tail length (TL); the latter two measurements were taken with a ruler and recorded to the nearest 1 mm. The sex of each specimen examined was determined either by dissection, or by noting the presence of hemipenes or another sexually dimorphic character (e.g., black spots in the gular region of females of *Stenocercus chota*). Clutch size was determined by counting oviductal eggs. Egg volume was calculated by the formula for a prolate spheroid: $V = 4/3\ \pi\ (\text{length}/2) \cdot (\text{width}/2)^2$. Drawings of specimens immersed in alcohol were made with a Wild-M8 stereo microscope equipped with a camera lucida.

Ecological distributions of each species are given in the Ecuadorian life zones defined by Cañadas-Cruz (1983); climatological data for the life zones also are from Cañadas-Cruz. Names for the physiographic regions (e.g., Cordillera Occidental, Saraguro Basin) were taken from Duellman (1979). Locality records shown on the distribution maps are based on specimens examined and literature records.

Diagnoses include several characters not used by other authors (e.g., Cadle, 1991, 1998; Fritts, 1974). Data included in the diagnoses were taken from the specimens examined, except for data taken from Cadle (1991, 1998) for *S. carrioni*, *limitaris*, and *simonsii*. Descriptions of syntypes, holotypes, and a neotype are provided. I did not examine the whole type series of any of the species for which I describe a syntype. The purpose of describing a syntype is to add data to the original description of each taxon based on one of the type specimens. Data on sexual variation are presented for most species and data on intraspecific geographic variation are presented for *Stenocercus iridescens*, *S. guentheri*, and *S. varius*. A dichotomous key is included to aid the identification of specimens.

SUMMARY OF TAXONOMIC CHARACTERS

The taxonomic conclusions of this study are based on the observation of external morphological features and color patterns. Character definitions follow those of Cadle (1991), Fritts (1974), Frost (1992), and Vitt and de la Torre (1996). Measurements and characters of scutellation are summarized in Table 1.

MEASUREMENTS

Head length–head width ratio (HL/HW).—Head length is the linear distance from the tip of the snout to the anterior edge of the tympanum. Head width was measured at the widest point of the head.

Head height–head width ratio (HH/HW).—Head height was measured at the level of the highest point of the head.

Body height–body width ratio (BH/BW).—Both measurements were recorded at midbody (i.e., halfway between the insertion of the fore and hind limbs).

Tail length–total length ratio (TL/ToL).—Total length is the sum of SVL and tail length. Specimens with broken or regenerated tails were not included.

Regenerated tail length–tail length ratio (RT/TL).—In this case, the tail length is the sum of the non-lost-tail length and the regenerated tail length.

SCUTELLATION

Scales around midbody (SM).—Number of longitudinal rows of scales counted in a transverse line around midbody (i.e., halfway between the insertion of the fore and hind limbs).

Vertebral scales (VS).—Number of middorsal scales from the occipital scales to the level of the posterior edge of the thigh when the latter was extended perpendicular to the body.

Paravertebral scales (PS).—Number of scales in the scale row laterally adjacent to the vertebral row. These were counted from the occipital scales to the level of the posterior edge of the thigh when the latter was extended perpendicular to the body.

Gular scales (GS).—Number of scales of the gular region counted between the ventral edges of the tympani. Tiny scales within the ear margin were not included. I followed Cadle's (1991) procedure—i.e., started and ended the counts with the first enlarged scale ventral to the tympani.

Supraocular scales (SS).—Number of scales on the dorsal surface of the orbit counted in a transverse line across its greatest width.

Internasal scales (IS).—Number of scales between the nasal scales. Internasals are located immediately posterior to postrostrals. They can be distinguished from the latter by their anteroposterior elongate shape, in contrast to the transverse elongate shape of postrostrals.

Posterior thigh scales.—The scales of the posterior surface of the thighs are smooth, keeled, keeled and mucronate, or granular.

Occipital scales.—The scales of the occipital region on the dorsal surface of the head are juxtaposed or imbricate. They are smooth, wrinkled, or keeled.

Ventral scales.—The scales of the ventral body surface, from the neck to the vent, are smooth, keeled, or keeled and mucronate.

Angulate temporal scales.—There are one or more enlarged, keeled scales that are approximately aligned with the superciliaries and that are located along the border between the lateral temporal scales and the posterior dorsal head scales. In many species of *Stenocercus*, these scales are not differentiated. One Ecuadorian species (*S. aculeatus*) has angulate temporals that bear a bladelike vane; I refer to this condition as projecting angulate temporals.

Apical pits.—Gular or ventral scales may bear an apical pit.

Subdigital lamellae on Finger IV (SF).—Number of subdigitals counted from the point of attachment of Fingers III and IV to the terminus of Finger IV.

Subdigital lamellae on Toe IV (ST).—Number of subdigitals counted from the point of attachment of Toes III and IV to the terminus of Toe IV.

NECK FOLDS

Stenocercus exhibits various kinds of neck folds (Fig. 1), which are described below.

Antehumeral fold.—A vertical or oblique fold that extends across the scapular region.

Posthumeral fold.—A fold extending obliquely downward the dorsolateral fold behind the forelimb.

Gular fold.—A fold immediately in front of the forelimb; it extends ventrally onto the neck.

Dorsolateral fold.—This fold is variable in length. It extends along the body and over the forelimb insertion of the antehumeral fold, with which it usually is confluent.

Ventrolateral fold.—A fold that extends along the ventrolateral region of the body posterior to the forelimb.

Supra-auricular fold.—This fold lies between the antehumeral fold and the ear and represents a continuation of the dorsolateral fold.

Oblique neck fold.—The oblique neck fold usually is located about midway between the posterior border of the ear and the forelimb. It is approximately parallel to the antehumeral fold.

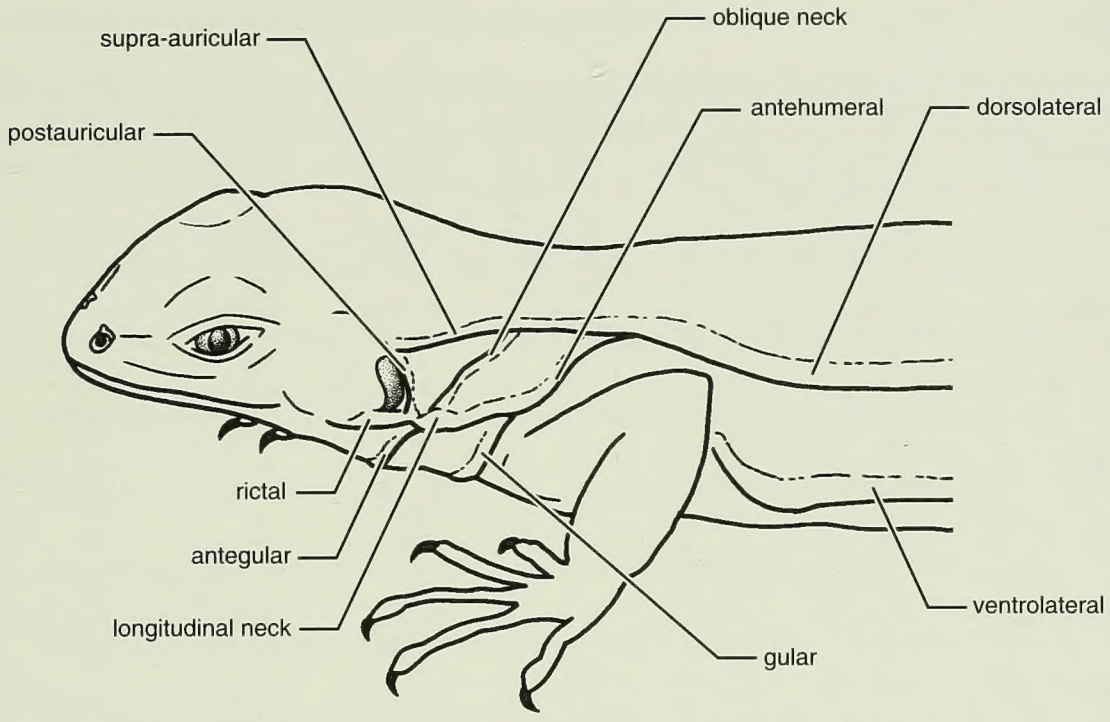


Fig. 1. Neck folds in *Stenocercus*. Illustration by L. Analía Púgener.

Antegular fold.—This fold traverses the ventral surface of the neck anterior to the gular fold.

Longitudinal neck fold.—This longitudinal fold extends along the ventrolateral part of the body from the posteroventral edge of the ear to the forelimb.

Postauricular fold.—This fold lies immediately behind the ear usually is confluent with the longitudinal neck fold and the supra-auricular fold.

Rictal fold.—A fold ventral and anteroventral to the ear.

POSTHUMERAL AND POSTFEMORAL POCKETS

Type 1.—Pocket absent, no apparent skin modification.

Type 2.—A noticeable skin modification, such as bare patch of skin, a series of wrinkles in the skin, or a shallow depression lined with scales different from surrounding body scales.

Type 3.—A shallow pocket, similar to Type 2, but with the addition of an overhanging fold of skin or thickened border. Its depth is generally less than half the diameter of the opening.

Type 4.—A moderate to deep pocket usually having a broad circular opening (narrow in *Stenocercus aculeatus*); its depth is greater than half the diameter of the opening.

Type 5.—A moderate to deep pocket with a narrow, slitlike opening; its depth is generally greater than half the greatest diameter of the opening. This type was observed only in postfemoral pockets in the species studied.

SPECIES ACCOUNTS

Stenocercus aculeatus (O'Shaughnessy)

Leiocephalus aculeatus O'Shaughnessy, 1879:303. Syntypes: BM 1946.8.12.33–36, from "Moyobamba, [Departamento San Martín], Peru."

Leiocephalus angulifer Werner, 1901:595. Holotype: ZMB 16594, from "Ecuador." Synonymy fide Burt and Burt, 1931.

Leiocephalus iridescens aculeatus (part)—Burt and Burt, 1931:269.

Ophryoessoides aculeatus—Etheridge, 1966:88.

Stenocercus aculeatus—Frost, 1988:78.

Diagnosis.—(1) Maximum total length in males 393 mm (n = 4); (2) maximum total length in females 322 mm (n = 8); (3) vertebral scales 38–43; (4) scales around midbody 36–45; (5) internasal scales 4–8; (6) gular scales 17–19; (7) lamellae on Finger IV 15–19; (8) lamellae on Toe IV 19–26; (9) posthumeral pocket Type 4; (10) postfemoral pocket Type 3; (11) projecting angulate temporals present; (12) one row of enlarged supraoculars that are more than twice the size of scales in adjacent rows; (13) occipital scales large, wrinkled, juxtaposed; (14) ventral scales keeled, imbricate, mucronate; (15) scales on posterior surfaces of thighs keeled, imbricate, mucronate; (16) antehumeral fold

Table 1. Summary of scutellation and measurements of the Ecuadorian species of *Stenocercus*. Range (first line), $\bar{x} \pm$ SD (second line) and *n* (third line) are given.

Character	*S. aculeatus*	*S. angel*	*S. carrioni*	*S. chota*	*S. festae*	*S. guentheri*	*S. haenschi*
Scales around midbody	36–45	52–60	66–96	45–59	47–64	59–83	57–64
	40.50 ± 2.58	55.00 ± 2.71	82.43 ± 8.13	50.93 ± 2.96	54.91 ± 4.43	68.00 ± 4.97	60.50 ± 4.95
	12	10	21	43	43	75	2
Vertebral scales	38–43	39–52	55–72	39–50	39–55	44–64	50
	40.25 ± 2.05	45.20 ± 3.43	64.43 ± 5.18	45.19 ± 2.79	46.70 ± 3.50	55.36 ± 3.74	—
	12	10	21	42	43	75	1
Paravertebral scales	45–54	50–67	76–96	55–74	46–72	59–89	64
	48.83 ± 2.79	58.40 ± 5.08	86.67 ± 5.36	61.60 ± 4.65	62.02 ± 5.37	74.07 ± 6.07	—
	12	10	21	42	43	75	1
Gular scales	17–19	20–25	37–52	18–25	16–29	21–31	56
	18.25 ± 0.62	21.70 ± 1.64	46.48 ± 4.14	20.52 ± 1.82	22.74 ± 2.30	25.53 ± 2.12	—
	12	10	21	42	43	75	1
Supraocular scales	4–5	4–5	4	4–6	4–6	5–7	5
	4.08 ± 0.29	4.80 ± 0.42	—	5.28 ± 0.50	5.02 ± 0.51	5.71 ± 0.56	—
	12	10	21	43	43	75	1
Internasal scales	4–8	1–4	5–7	2–4	2–4	2–4	3
	5.67 ± 1.37	2.40 ± 0.84	5.81 ± 0.56	3.26 ± 0.73	3.44 ± 0.70	3.28 ± 0.83	—
	10	10	21	43	43	75	1
Subdigital lamellae: Finger IV	15–19	13–22	23–28	14–20	14–22	15–23	26–28
	17.50 ± 1.38	17.20 ± 2.25	25.19 ± 1.25	17.64 ± 1.48	17.40 ± 1.75	18.17 ± 1.62	27.00 ± 1.41
	12	10	21	42	42	75	2
Subdigital lamellae: Toe IV	19–26	20–28	27–32	23–31	21–33	22–36	30
	23.25 ± 1.82	25.20 ± 2.15	29.80 ± 1.44	26.29 ± 1.58	26.57 ± 2.17	27.39 ± 2.41	—
	12	10	20	42	42	74	1
Head length/head width	1.12–1.37	1.16–1.30	—	1.17–1.41	1.14–1.43	1.10–1.35	1.34
	1.23 ± 0.09	1.22 ± 0.05	—	1.28 ± 0.06	1.29 ± 0.06	1.26 ± 0.05	—
	12	10	—	41	42	73	1
Head height/head width	0.79–1.07	0.78–0.93	—	0.67–0.97	0.75–1.16	0.75–1.05	0.86
	0.87 ± 0.07	0.88 ± 0.05	—	0.84 ± 0.06	0.86 ± 0.07	0.87 ± 0.07	—
	12	10	—	41	42	72	1
Body height/body width	0.67–1.15	0.71–0.97	—	0.42–1.04	0.63–1.18	0.50–1.15	0.8
	0.95 ± 0.17	0.83 ± 0.09	—	0.69 ± 0.16	0.83 ± 0.12	0.81 ± 0.14	—
	10	9	—	39	31	68	1
Regen. tail length/tail length	—	0.46–1.63	—	0.03–3.07	0.27–4.14	0.11–3.40	—
	—	0.85 ± 0.46	—	1.11 ± 1.05	1.45 ± 1.31	1.64 ± 0.99	—
	—	5	—	9	10	13	—
Tail length/total length	0.65–0.74	0.62–0.65	0.56–0.60	0.55–0.66	0.52–0.71	0.57–0.72	—
	0.69 ± 0.02	0.64 ± 0.01	0.57 ± 0.01	0.63 ± 0.02	0.64 ± 0.04	0.64 ± 0.03	—
	12	4	10	29	22	53	—
Maximum size males (mm)	393	214	—	207	241	255	—
Maximum size females (mm)	322	155	—	172	206	188	—

nearly inconspicuous; (17) tail strongly compressed laterally; (18) gular region of males black; (19) dorsum bronzed green in males and pale brown in females.

Stenocercus aculeatus differs from other species of *Stenocercus* by the combination of the following characters: keeled ventrals, large occipital scales, one row of enlarged supraoculars that are more than twice the size of the scales in adjacent rows, one canthal scale, two projecting angulate temporals, distinct dorsolateral crest from neck to base of tail, posthumeral pocket Type 4, and postfemoral pocket Type 3.

Description of syntype BM 1946.8.12.34.—Head wider than high (HH/HW = 0.91); occipitals , parietals, and interparietal large, slightly wrinkled, and juxtaposed; 5 internasals; 1 canthal on each side, separated from the nasal by tiny scale; supraoculars slightly wrinkled, 1 row of scales being more than twice size of scales in adjacent rows; lateral temporals imbricate, slightly keeled; 2 projecting angulate temporals on each side of head; parietal eye not visible; gulars keeled, imbricate; mental in contact with first pair of infralabials and first pair of postmentals.

Dorsal and lateral scales of body and neck keeled, imbricate; vertebrals large, forming prominent, serrate vertebral crest (Fig. 2); distinct dorsolateral crest from neck to base of tail; ventrals keeled, imbricate, mucronate; preauricular fringe absent; antehumeral fold nearly inconspicuous; limb scales keeled, imbricate, mucronate; 19 lamellae on Finger IV; 26 lamellae on Toe IV; tail strongly com-

Table 1
Continued

Character	*S. humeralis*	*S. iridescens*	*S. limitaris*	*S. ornatus*	*S. rhodomelas*	*S. simonsii*	*S. varius*
Scales around midbody	98–119	35–52	39–54	46–58	43–55	79–102	74–88
	108.38 ± 6.06	41.57 ± 3.31	47.30 ± 3.16	51.95 ± 2.73	48.81 ± 2.72	94.20 ± 6.63	82.28 ± 4.38
	34	42	43	40	32	20	25
Vertebral scales	81–102	40–52	40–52	36–50	43–54	59–98	60–74
	90.73 ± 6.01	45.31 ± 3.22	45.70 ± 2.54	44.03 ± 3.48	47.69 ± 3.24	73.75 ± 9.76	67.64 ± 3.57
	33	42	43	39	32	20	25
Paravertebral scales	106–145	43–58	—	53–66	49–61	94–118	76–97
	127.33 ± 7.70	49.50 ± 3.76	—	60.00 ± 3.55	55.09 ± 2.97	107.20 ± 9.02	87.24 ± 5.31
	33	42	—	39	32	20	25
Gular scales	43–68	16–20	17–23	15–23	17–20	36–57	42–60
	49.44 ± 4.43	18.19 ± 1.09	20.10 ± 1.28	18.45 ± 1.47	18.31 ± 0.93	49.26 ± 5.33	50.64 ± 4.46
	34	42	43	40	32	19	25
Supraocular scales	6–8	2–5	3–5	5–7	3–6	4	5–7
	6.97 ± 0.46	3.33 ± 0.69	—	5.43 ± 0.59	5.22 ± 0.66	—	5.52 ± 0.59
	34	42	44	40	32	19	25
Internasal scales	2–4	2–4	4–5	2–4	2–4	6–9	4–5
	3.88 ± 0.41	2.45 ± 0.59	—	3.63 ± 0.67	2.47 ± 0.62	7.11 ± 0.76	4.04 ± 0.20
	34	42	44	40	32	19	25
Subdigital lamellae: Finger IV	24–33	15–18	17–23	17–25	14–21	24–28	24–28
	29.09 ± 2.01	15.90 ± 0.89	19.70 ± 1.26	21.23 ± 1.98	16.81 ± 1.53	26.15 ± 1.23	25.61 ± 1.16
	34	41	44	40	32	20	23
Subdigital lamellae: Toe IV	28–40	22–28	24–32	26–37	22–29	28–37	27–34
	36.79 ± 2.52	24.73 ± 1.57	27.50 ± 1.93	30.03 ± 2.28	25.69 ± 1.62	31.15 ± 2.46	29.78 ± 1.51
	33	41	44	40	32	20	23
Head length/head width	1.15–1.43	1.09–1.31	—	1.06–1.37	0.98–1.50	—	1.21–1.50
	1.28 ± 0.06	1.23 ± 0.05	—	1.28 ± 0.06	1.25 ± 0.09	—	1.32 ± 0.07
	34	42	—	40	30	—	25
Head height/head width	0.67–0.93	0.72–1.04	—	0.71–0.98	0.69–0.99	—	0.73–1.04
	0.78 ± 0.06	0.88 ± 0.07	—	0.85 ± 0.05	0.83 ± 0.07	—	0.83 ± 0.07
	34	42	—	40	29	—	25
Body height/body width	0.56–0.9	0.66–1.19	—	0.62–1.36	0.64–1.03	—	0.54–0.96
	0.70 ± 0.08	0.86 ± 0.14	—	0.82 ± 0.16	0.81 ± 0.10	—	0.73 ± 0.09
	28	36	—	34	16	—	23
Regen. tail length/tail length	1.58–3.84	0.55–3.38	—	0.01–2.76	0.32–3.82	—	0.01–2.87
	2.51 ± 0.81	1.97 ± 2.00	—	1.41 ± 0.95	1.16 ± 1.33	—	1.13 ± 1.29
	6	2	—	10	6	—	6
Tail length/total length	0.62–0.68	0.63–0.70	0.66–0.70	0.60–0.72	0.57–0.66	0.59–0.65	0.60–0.66
	0.66 ± 0.01	0.67 ± 0.02	—	0.68 ± 0.02	0.63 ± 0.02	0.63 ± 0.01	0.63 ± 0.02
	25	30	—	26	23	5	15
Maximum size males (mm)	301	292	—	294	235	—	234
Maximum size females (mm)	272	294	—	207	236	—	208

pressed; all caudals keeled, imbricate, and mucronate; vertebral crest extending more than half length of tail; tail length 74% of total length; posthumeral pocket Type 4 with narrow opening; postfemoral pocket Type 3.

Data on syntype BM 1946.8.12.34: Male (Fig. 2); SVL = 103 mm; TL = 290 mm; HW = 17.5 mm; HL = 23.7 mm; HH = 15.4 mm; SM = 36; VS = 38; PS = 48; SS = 4; IS = 4; GS = 17; SF = 19; ST = 26.

Variation.—Measurements and scutellation of *Stenocercus aculeatus* in Table 1. Head (Fig. 3A and C) normally wider than high (HH/HW = 0.79–1.07, $\bar{x}$ = 0.87 ± 0.07, n = 12); 4–8 internasals, usually 6 (50% of the specimens); body usually wider than high (BH/BW = 0.67–1.15, $\bar{x}$ = 0.95 ± 0.17, n = 10); 15–19 lamellae on Finger IV; 19–26 lamellae on Toe IV; tail length 65–74% of total length. Sexual variation for mensural characters in *Stenocercus aculeatus* is presented in Table 2.

Color in life: Dorsum bronzed-green in males; flanks brown; white stripe extending from ear to forelimb; white stripe extending from above ear to shoulder; another white stripe extending from dorsolateral crest to forelimb; black gular region (O´Shaughnessy, 1879, 1881).

An adult male (KU 121093) differs from the above description by the following features: dorsum brown; flanks lighter, almost yellow-brown; black supraxillary patch; face black; throat black; venter pink with bluish-gray sides; sides of tail with blue spots; ventral surface of tail blue (John D. Lynch, field notes, 24 July 1968). Female KU

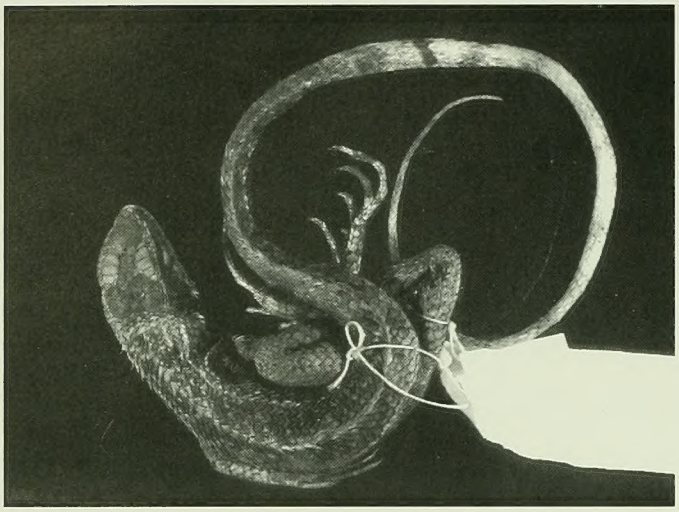


Fig. 2. *Stenocercus aculeatus*, syntype, BM 1946.8.12.34, male.

121092: dorsum of body pale brown; flanks, dorsum of head, and base of tail dark brown; cream-brown line in front of shoulder; reddish-brown line below eye with black edges; greenish-brown venter with some pink coloration; tongue reddish brown anteriorly and cream posteriorly; iris pale copper-brown (Fig. 4G; John D. Lynch, field notes, 4 July 1968).

Color in preservative: Males with dark brown or dark olive dorsum; dark triangular marks pointing backwards on vertebral line; sides of neck with scattered pale blue and green scales; white stripe descending from dorsolateral crest to insertion of forelimb; head dark brown or olive-green; large white mark behind each eye in 10% of specimens; gular region black; venter iridescent pink or grayish green with scattered blue and pink scales; tail olive-green, with large dark transverse bands on 90% of specimens. Females dark brown; sides and dorsum of head pale brown in contrast to body color in some specimens. Dark brown stripe extending posteroventrally from eye to supralabials in both sexes.

Natural history.—One female (EPN 5902) collected in May 1954 contained two oviductal eggs; the sizes of these eggs are 22.8 mm × 8.9 mm and 23.2 mm × 9.8 mm, and their respective volumes are 945.6 mm^3 and 1166.6 mm^3. The smallest individual (QCAZ 1635) was collected on 01 May 1993 and has a total length of 112 mm (SVL = 39 mm, TL = 73 mm).

Distribution and ecology.—In Ecuador, *Stenocercus aculeatus* is known from elevations of 537–1200 m on the eastern slopes of the Cordillera Oriental. The species inhabits the upper valleys of the Río Napo and Río Pastaza (Atlantic Drainage) in Provincia Pastaza (Fig. 6). The distribution lies mainly within Very Humid Premontane Forest and Pluvial Premontane Forest life zones. The mean annual temperature is 18–24°C in both zones; the mean annual precipitation is 2000–4000 mm and 4000–8000 mm, respectively.

Table 2. Sexual variation in scutellation and measurements of *Stenocercus aculeatus*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	37–45	36–43
	40.38 ± 2.39	40.75 ± 3.30
	8	4
Vertebral scales	38–43	38–43
	40.25 ± 1.91	40.25 ± 2.63
	8	4
Paravertebral scales	45–54	48–53
	48.00 ± 2.83	50.50 ± 2.08
	8	4
Gular scales	18–19	17–19
	18.38 ± 0.52	18.00 ± 0.82
	8	4
Supraocular scales	4–5	4
	4.13 ± 0.35	—
	8	4
Internasal scales	4–8	4–7
	5.63 ± 1.51	5.75 ± 1.26
	8	4
Subdigital lamellae on Finger IV	15–19	18–19
	17.00 ± 1.41	18.50 ± 0.58
	8	4
Subdigital lamellae on Toe IV	19–25	23–26
	22.88 ± 1.96	24.00 ± 1.41
	8	4
Head length/head width	1.12–1.37	1.20–1.35
	1.2 ± 0.09	1.28 ± 0.06
	8	4
Head height/head width	0.79–1.07	0.80–0.88
	0.88 ± 0.08	0.85 ± 0.04
	8	4
Body height/body width	0.67–1.04	1.11–1.15
	0.88 ± 0.14	1.13 ± 0.03
	7	3
Tail length/total length	0.65–0.72	0.69–0.74
	0.68 ± 0.02	0.71 ± 0.02
	8	4
Maximum size (mm)	322	393

O'Shaughnessy (1879, 1881) reported specimens from Canelos (1°36' S, 77°45' W, Provincia Pastaza) and Pallatanga (Provincia Chimborazo), Ecuador, and from Moyobamba (Departamento San Martín, Peru). Pallatanga (01°59' S, 78°58' W) is on the western slopes of the Cordillera Occidental of the Andes. I consider this locality to be erroneous for two reasons. First, this record would be the only one from the western slopes of the Andes. Second, for the same reason, Pallatanga has been considered to be erroneous for other taxa (e.g., *Osteocephalus buckleyi*, *Prionodactylus manicatus*) of the same collection (Trueb and Duellman, 1971; Uzzell, 1973). Etheridge (1966) and Peters and Donoso-Barros (1970) reported *Stenocercus aculeatus* from Peru, but they did not mention specific

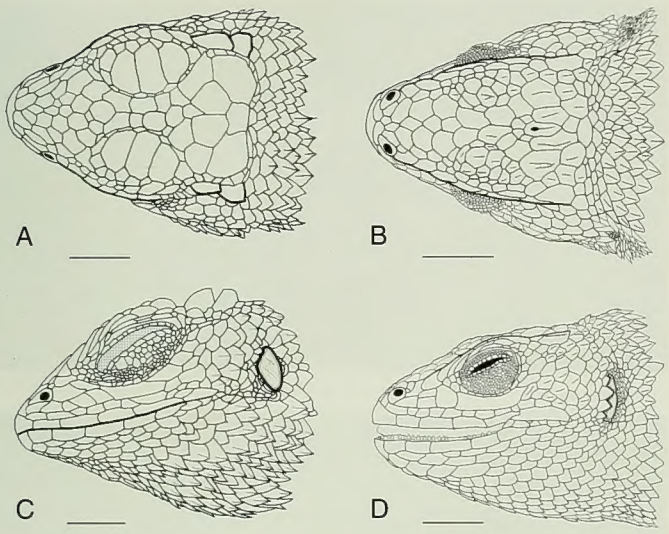


Fig. 3. Dorsal and lateral views of the heads of two species of *Stenocercus*. A and C *S. aculeatus*, EPN 4051, male. B and D *S. angel*, holotype, QCAZ 3733, male. Damaged tissue is stippled. Scale bars = 5 mm.

locality. Avila-Pires (1995) and Cadle (1991) reported this species from several localities in Provincia Pastaza, Ecuador.

Stenocercus ***angel*** new species

Holotype.—QCAZ 3733, an adult male, from 8 km NE El Angel on road to Tulcán (00°40' N, 77°52' W), Provincia Carchi, Ecuador, collected on 17 May 1997 by Jaime A. Chaves and Juan M. Guayasamín. The holotype is situated in the Museo de Zoología, Pontificia Universidad Católica del Ecuador.

Paratypes.—QCAZ 1354, 3732, 4117–4119 with same locality data as holotype; QCAZ 1358, El Angel (00°38' N, 77°56' W, 3015 m), Provincia Carchi; QCAZ 3777, Estación Biológica Guanderas, Provincia Carchi; QCAZ 1322, El Playón de San Francisco (00°38' N, 77°38' W, 3300 m), Provincia Sucumbíos; QCAZ 3792, 13.6 km W Tulcán on road to Tufiño (00°49' N, 77°49' W, 3040 m), Provincia Carchi.

Diagnosis.—(1) Maximum total length in males 214 mm (n = 8); (2) maximum total length in females 155 mm (n = 2); (3) vertebral scales 39–52; (4) scales around midbody 52–60; (5) internasal scales 1–4; (6) gular scales 20–25; (7) lamellae on Finger IV 13–22; (8) lamellae on Toe IV 20–28; (9) posthumeral pocket Type 2; (10) postfemoral pocket Type 2; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, keeled or wrinkled, juxtaposed; (14) ventral scales smooth or slightly keeled, imbricate; (15) scales on posterior surfaces of thighs keeled, imbricate; (16) antehumeral fold absent; (17) tail not laterally compressed; (18) gular region of males black in 25% of the specimens; (19) dorsum green or dark brown in males and dark brown in females.

Stenocercus angel is distinguished from other species of *Stenocercus* by the combination of the following characters: smooth ventrals, imbricate scales on posterior surface of thigh, posthumeral pocket Type 2, postfemoral pocket Type 2, 52–60 scales around midbody, and dark green or dark brown background color.

Description of holotype.—Head (Fig. 3B and D) wider than high (HH/HW = 0.93); occipitals, parietals, interparietal, and postparietals small, keeled or wrinkled, juxtaposed; 2 postrostrals, each wider than long; 4 internasals; 2 canthals on each side, anterior one in contact with nasal; supraoculars keeled or wrinkled, juxtaposed; enlarged supraocular scales absent; lateral temporals keeled, slightly imbricate; parietal eye visible; gulars large, smooth, imbricate, bearing apical pit; mental in contact with first infralabials and first postmentals.

Body wider than high (BH/BW = 0.78); dorsal and lateral scales of body and neck keeled, imbricate, slightly mucronate; vertebrals large, forming prominent, serrate, vertebral crest; ventrals smooth or slightly keeled, imbricate; preauricular fringe moderately developed; neck folds absent; dorsal scales and proximal ventral scales on forelimbs keeled, imbricate; dorsal scales of hands and distal ventral scales of forelimbs smooth, imbricate; palmar scales keeled, imbricate, mucronate; dorsal scales on hind limbs, plantar scales, and scales on posterior surface of thigh keeled, imbricate; ventral scales on hind limbs smooth, imbricate; 17 lamellae on Finger IV; 25 lamellae on Toe IV; tail not compressed; dorsal and lateral caudal scales keeled, imbricate, mucronate; anterior ventral caudal scales smooth, imbricate, bearing apical pit; posterior ventral caudal scales keeled, imbricate; posthumeral and postfemoral pockets Type 2. Part of tail regenerated; therefore, TL/ToL not calculated.

In life, the holotype had the following color features: dorsum dark green with 8–10 transverse brown stripes over vertebral line, from neck to anterior part of tail; dorsum of head and tail dark brown; gular region black; first two pairs of genials and first infralabials gray; ventral surface of body, limbs, and tail with irregular yellow or green spots; iris copper (Fig. 4A, B).

Data on holotype: Male; SVL = 82 mm; TL = 70 mm; RT = 32 mm; HW = 15.3 mm; HL = 18.4 mm; HH = 14.3 mm; BW = 22.1 mm; BH = 17.3 mm; SM = 58; VS = 48; PS = 56; SS = 5; IS = 4; GS = 23; SF = 17; ST = 25.

Variation.—Measurements and scutellation of *Stenocercus angel* in Table 1. Head wider than high (HH/HW = 0.78–0.93, $\bar{x}$ = 0.88 ± 0.05, n = 10); 1–4 internasals, usually 2 (50% of the specimens); parietal eye visible in 90% of the specimens; body wider than high (BH/BW =

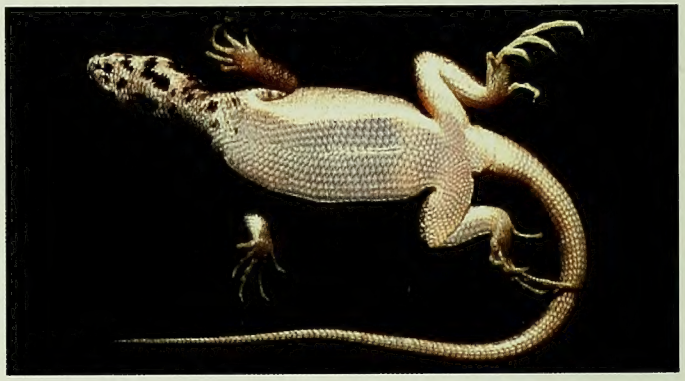
Stenocercus angel, holotype, QCAZ 3733, male, 82 mmSVL (LAC).

Stenocercus angel, holotype, QCAZ 3733, male, 82 mm SVL (LAC).

Stenocercus chota, QCAZ 3768, male, 69 mm SVL (LAC).

Stenocercus chota, QCAZ 3775, male, 60 mm SVL (LAC).

Stenocercus chota, QCAZ 3774, female, 59 mm SVL (LAC).



Stenocercus chota, QCAZ 3774, female, 59 mm SVL (LAC).

Stenocercus aculeatus, KU 121092, female, 82 mm SVL (WED).

Stenocercus festae, KU 134608, male, 83 mm SVL (WED).

Fig. 4. Four species of *Stenocercus*.

Stenocercus guentheri, QCAZ 4153, male, 72 mm SVL (LAC).

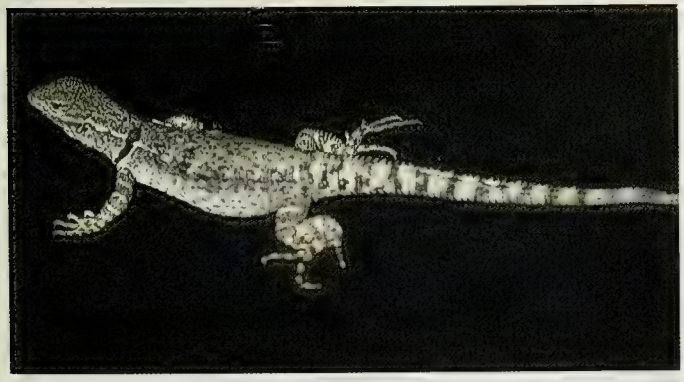
Stenocercus guentheri, QCAZ 4153, male, 72 mm SVL (LAC).

Stenocercus guentheri, QCAZ 4108, male, 70 mm SVL (LAC).

Stenocercus humeralis, KU 121138, male, 74 mm SVL (WED).

Stenocercus iridescens, KU 164168, male, 78 mm SVL (WED).

Stenocercus ornatus, KU 121126, male, 73 mm SVL (WED).



Stenocercus simonsii, KU 134165, female, 72 mm SVL (WED).

Stenocercus varius, QCAZ 2015, male, 69 mm SVL (LAC).

Fig. 5. Six species of *Stenocercus*.

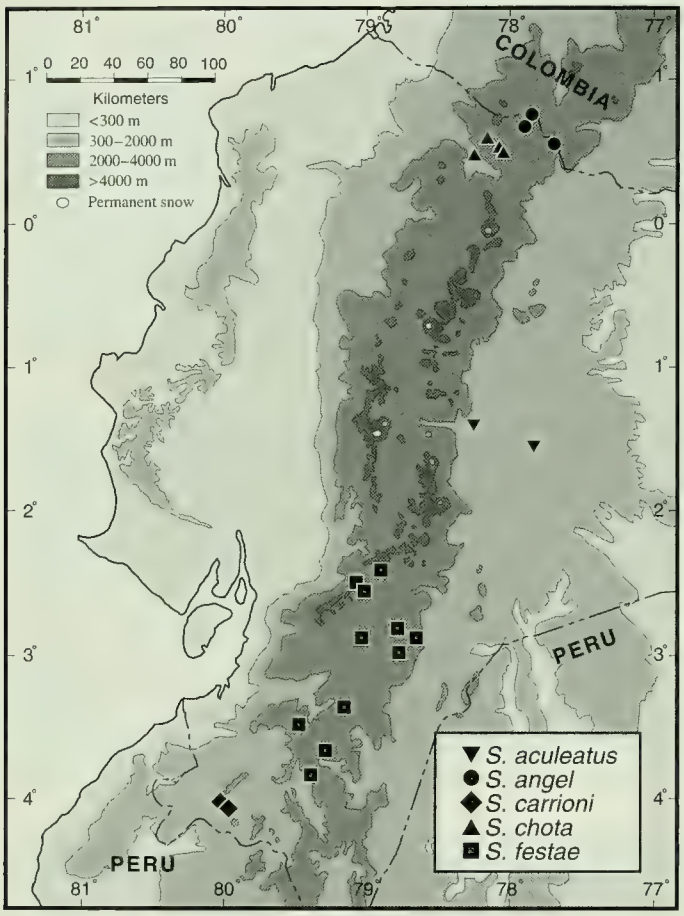


Fig. 6. Distribution of five species of *Stenocercus* in Ecuador.

0.71–0.97, $\bar{x} = 0.83 \pm 0.09$, $n = 9$); ventral scales on proximal parts of forelimbs smooth and imbricate in some specimens; 13–22 lamellae on Finger IV; 20–28 lamellae on Toe IV; tail length 62–65% of total length.

Color in life: The background color in *Stenocercus angel* varies between dark green and dark brown. One male paratype (QCAZ 4117) with the same pattern as the holotype differs from it by having a dark brown dorsum.

Another male paratype (QCAZ 3777) differs from the holotype in the following color features: dorsum of head green with small black spots; black stripe extending from inferior edge of orbit to superior border of tympanum; some dorsal scales blue; yellow vertical lines on flanks; gular region bluish green; venter grayish blue; throat yellow; yellow anal mark extending onto ventral surface of hind limbs and anterior ventral portion of tail.

A female (QCAZ 3732) has a dark brown dorsum with 8–10 yellowish-brown transverse stripes and a yellowish-brown venter with scattered dark brown flecks. Two subadults (QCAZ 4118, 4119) differ from adults in having a pair of lateral whitish stripes on each side of body. One stripe extends posteriorly from the angle of the mouth below the tympanum to insertion of forelimb. The other stripe extends posteriorly from the eye over the tympanum to the insertion of hind limb, where it becomes nearly inconspicuous. Also, in QCAZ 4119, the gular region is bright yellow, and in QCAZ 4118, there is a narrow black vertebral line over the tail.

Color in preservative: Dorsum of males dark brown or greenish blue with 8–10 pale brown, greenish-brown, or black, short transverse stripes middorsally, from neck to anterior part of tail; head pale brown, dark brown, or olive-green; gular region cream, pale green, or black; venter cream or pale yellow with pale green; some ventral scales with black borders; pale gray longitudinal midventral stripe in 37% of the specimens. Dorsum of females pale brown; head dark brown; gular region brown with scattered yellowish-brown, dark brown, or yellowish-green marks; venter pale green or yellow with scattered dark brown flecks; tail dark brown.

Natural history.—One female (QCAZ 3732) collected on 17 May 1997 contained two oviductal eggs. The sizes of these eggs are 16.1 × 9.46 mm and 16.23 × 9.39 mm; their volumes are 754.4 mm^3 and 749.3 mm^3, respectively. The smallest juveniles (QCAZ 4118, 4119) were collected in January 1999; each has a total length of 138 mm (SVL = 52 mm, TL = 86 mm and SVL = 48, TL = 90, respectively).

Distribution and ecology.—*Stenocercus angel* is known from elevations of 3015–3560 m in the northern Andes (Nudo de Pasto). The species inhabits the upper drainage systems of the Río Aguarico (Atlantic Drainage) and Río Mira (Pacific Drainage) in Provincia Sucumbíos and Provincia Carchi, respectively (Fig. 6). The distribution lies mainly within Humid Montane Forest, Very Humid Montane Forest, and Low Humid Montane Forest life zones. The mean annual temperature is 7–12°C in the former two life zones and 12–18°C in the third. The mean annual precipitation is 500–1000 mm in the Humid Montane Forest and 1000–2000 mm in the Very Humid and Low Humid Montane Forests.

Most specimens were found in undisturbed areas of paramo. They were basking on the ground near plants of the thorny bromeliad genus *Puya* , in which they hide when disturbed. Specimen QCAZ 4118 was sleeping near a leptodactylid frog (*Eleutherodactylus curtipes*; QCAZ 12820) at the base of a plant genus *Cortaderia* (Poaceae) late in the afternoon.

Etymology.—The specific name is a noun in apposition and refers to the Páramo del Angel, where the species was found initially. This paramo is considered to be one of the most humid Ecuadorian paramos, and it includes one of the few populations of *Espeletia* (Asteraceae) in Ecuador (Coello, 1994); *Espeletia* is endemic to the northern Andes.

Stenocercus carrioni Parker

Stenocercus carrioni Parker, 1934:268. Holotype: BM 1933.6.24.75, a male from "Zamora, 3250 ft (= 990.6 m), [Provincia Zamora Chinchipe] Ecuador."

Diagnosis.—(1) Maximum SVL in males 74 mm (Cadle, 1991); (2) maximum SVL in females 71 mm (Cadle, 1991); (3) vertebral scales 55–72; (4) scales around midbody 66–96; (5) internasal scales 4; (6) gular scales 37–52; (7) lamellae on Finger IV 23–28; (8) lamellae on Toe IV 27–32; (9) posthumeral pocket Type 1 or 2; (10) postfemoral pocket Type 3; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, smooth or slightly wrinkled, juxtaposed; (14) ventral scales smooth, imbricate; (15) scales on posterior surfaces of thighs granular; (16) antehumeral fold well developed; (17) tail not or only slightly compressed laterally; (18) gular region in males not black; (19) dorsum greenish brown in males.

Stenocercus carrioni differs from other species of *Stenocercus* by the combination of the following characters: smooth ventrals, granular scales on posterior surface of thigh, distinct vertebral row on neck and at least on anterior part of the body, 2 caudal whorls per autotomic segment, distal portion of tail with caudal whorls alternating in size, posthumeral pocket Type 1 or 2, postfemoral pocket Type 3, 66–69 scales around midbody, 23–28 lamellae on Finger IV, no black collar in front of forelimbs, and no differences in pattern between sexes.

Description and variation.—Cadle's (1991) description is sufficient. Measurements and scutellation of *S. carrioni* summarized in Table 1 were taken from Cadle (1991), who also commented on the holotype.

Distribution and ecology.—*Stenocercus carrioni* occurs at elevations of 1320–1900 m in southern Ecuador. It inhabits the upper valley of the Río Chira (Pacific Drainage) in Provincia El Oro and Provincia Loja (Fig. 6). The distribution lies within the Humid Premontane Forest, where the mean annual precipitation is 1000–2000 mm and the mean annual temperature is 18–24°C. *Stenocercus carrioni* is sympatric with *S. limitaris* in Alamor (04°02' S, 80°02' W, 1325 m), Provincia Loja. Fritts (1974) mentioned the possibility that *S. carrioni* occurs in sympatry with *S. ornatus*.

Remarks.—The holotype of *Stenocercus carrioni* is the only specimen that has been reported from the eastern slopes of the Cordillera Oriental of the Andes (Zamora 04°04' S, 78°56' W). All other specimens are from the western slopes of the Cordillera Occidental. Fritts (1974) questioned the authenticity of Zamora as the type locality of *S. carrioni* because some other taxa recorded by Parker (1934) from Zamora (e.g., *Atelopus* and *Pholidobolus*) have been collected subsequently only from higher elevations. The holotype of *S. carrioni* is part of a collection obtained by Clodoveo Carrión (an Ecuadorian naturalist) deposited in the British Museum (Natural History). The *Atelopus* in the collection could be either *Atelopus boulengeri* or an undescribed species (Luis A. Coloma, pers. comm.), and the *Pholidobolus* in the collection could be either *P. annectens* or *P. macbrydei*, taxa known from Provincia Loja and Provincia Zamora-Chinchipe (Montanucci, 1973). Montanucci (1973) did not report any species of *Pholidobolus* from Zamora, but he did not check specimens in the British Museum. On the other hand, Parker (1934) recorded from Zamora other species, such as *Anolis fuscoauratus* and *A. ortonii*, that are known to occur there. Although Cadle (1991) did not question Zamora as the type locality of *S. carrioni*, the presence of the species at Zamora is highly questionable.

Stenocercus ***chota*** new species

Holotype.—QCAZ 3768, an adult male, from the Panamerican Highway 5 km E Chota (00°28' N, 78°01' W), Valle del Chota, Provincia Imbabura, Ecuador, collected on 8 July 1997 by Luis M. Díaz and Omar Torres-Carvajal. The holotype is situated in the Museo de Zoología, Pontificia Universidad Católica del Ecuador.

Paratypes.—QCAZ 2768, 3755, 3757, 3762–3776, with same locality data as holotype; QCAZ 806, 897–902, 3791, 3794, Ambuquí–Monte Olivo Road, 6.5 km E Panamerican Highway, 00°25' N, 77°55' W, 1940 m, Provincia Imbabura; QCAZ 799, Ambuquí (00°27' N, 78°01' W, 1780 m), Provincia Imbabura; QCAZ 2654, 2655, 2773–2778, Chota (00°28' N, 78°04' W), Provincia Imbabura; EPN 5848, in the vicinity of Lago Yaguarcocha, Provincia Imbabura; EPN 5858–5860, 5862–5864, Río Cachabí, Provincia Esmeraldas; MZUT R2154.1–5, R2154.25–29, La Concepción (00°35' N, 78°07' W, 1575 m), Provincia Carchi.

Diagnosis.—(1) Maximum total length in males 207 mm ($n = 11$); (2) maximum total length in females 172 mm ($n = 21$); (3) vertebral scales 39–50; (4) scales around midbody 45–59; (5) internasal scales 2–4; (6) gular scales 18–25; (7) lamellae on Finger IV 14–20; (8) lamellae on Toe IV 23–31; (9) posthumeral pocket Type 2; (10) postfemoral pocket Type 2; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, keeled or wrinkled, juxtaposed; (14) ventral scales smooth or slightly keeled, imbricate; (15) scales on posterior surfaces of thighs keeled, imbricate; (16) antehumeral fold absent; (17) tail not laterally compressed; (18) gular region of males not black; (19) dorsum grayish brown or pale brown in males and females.

The following combination of characters distinguish *Stenocercus chota* from other species of *Stenocercus*: smooth ventrals, imbricate scales on posterior surface of thigh, posthumeral pocket Type 2, postfemoral pocket Type 2, 45–59 scales around midbody, large black spots in gular

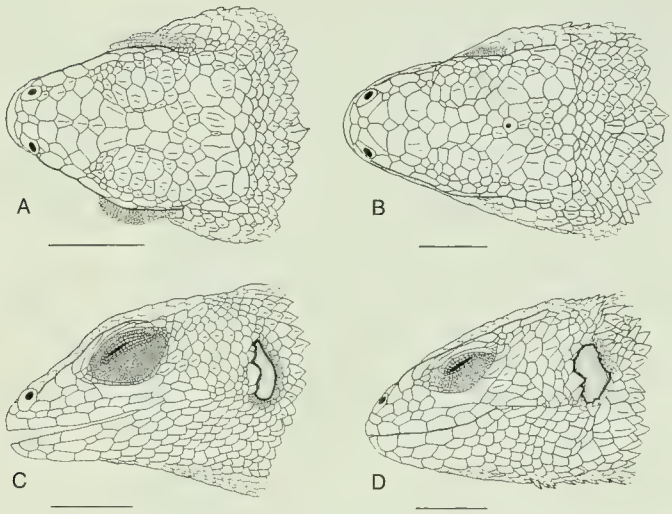


Fig. 7. Dorsal and lateral views of the heads of two species of *Stenocercus*. A and C *S. chota*, holotype, QCAZ 3768, male. B and D *S. festae*, QCAZ 1347, male. Scale bars = 5 mm.

region of females, and large blue longitudinal mark on each side of dark midventral stripe in males.

Description of holotype.—Head (Fig. 7A and C) wider than high (HH/HW = 0.82); occipitals, parietals, interparietal, and postparietals small, keeled, and slightly imbricate; 4 postrostrals, 2 wider than long and 2 as wide as long; 4 internasals; 2 canthals on each side, the most anterior separated from the nasal by 2 tiny scales; supraoculars keeled or wrinkled and juxtaposed; row of enlarged supraocular scales absent; lateral temporals slightly keeled and imbricate; parietal eye visible; gulars large, smooth, and imbricate each with an apical pit; mental in contact with the first infralabials, first postmentals and with a tiny scale between postmentals.

Body wider than high (BH/BW = 0.78); dorsal and lateral scales of body and neck keeled, imbricate, and slightly mucronate; vertebrals large, forming a prominent serrate vertebral crest; ventrals smooth and imbricate; preauricular fringe well developed; neck folds absent; limb scales keeled and imbricate except the ventral scales of hind limbs that are smooth and imbricate; dorsal scales of hind limbs and plantar scales mucronate; 20 lamellae on Finger IV; 28 lamellae on Toe IV; tail laterally compressed; caudals keeled and imbricate except those of the anterior ventral region that are smooth and imbricate; tail length 62% of total length; posthumeral and postfemoral pockets Type 2.

In life, the coloration of the holotype was: dorsum grayish brown with 12 transverse brown stripes longitudinally disposed over vertebral line, from neck to anterior part of tail; white and dark brown spots on dorsum of body and flanks; limbs with more white spots than dorsum and with brown narrow transverse lines (5–6 on forelimbs and 8–10 on hind limbs); dorsum of head dark gray; sides of head white with gray spots; gular region reddish cream; small dark midventral longitudinal stripe extending from throat to point before insertion of hind limbs; large blue longitudinal mark on each side of dark midventral stripe; rest of ventral surface faintly orange with several tiny brown spots; yellow anal mark extending to ventral surfaces of thighs and anterior ventral surface of tail; ventral surface of tail cream; iris bronzed green.

Data on holotype: Male; SVL = 69 mm; TL = 114 mm; HW = 14 mm; HL = 16.8 mm; HH = 11.5 mm; BW = 19 mm; BH = 14.9 mm; SM = 59; VS = 49; PS = 71; SS = 5; IS = 4; GS = 22; SF = 20; ST = 28.

Variation.—Measurements and scutellation of *Stenocercus chota* in Table 1. Head wider than high (HH/HW = 0.67–0.97, $\bar{x}$ = 0.84 ± 0.06, n = 41); usually 2 postrostrals, wider than long; 2–4 internasals, usually 3 (42% of the specimens) or 4 (42%); the most anterior canthal in contact with the nasal in some specimens; parietal eye visible in 87% of the specimens; lateral temporal scales juxtaposed in some specimens; body wider than high (BH/BW = 0.42–1.04, $\bar{x}$ = 0.69 ± 0.16, n = 39); ventrals slightly keeled in some specimens; anterior ventral scales of tail rarely keeled; tail not compressed in females; lamellae on Finger IV 14–20; lamellae on Toe IV 23–31; tail length 55–66% of total length; posthumeral and postfemoral pockets Type 2. Sexual variation in measurements and scutellation in *S. chota* is presented in Table 3.

Color in life: Two male paratypes (QCAZ 3775, 3776) differ slightly in coloration from the holotype by having yellow spot in each axilla; dark midventral stripe indistinct; yellow anal mark posteriorly delineated by black; iris bronzed red. Also, a dark midventral longitudinal stripe extends onto the ventral surfaces of the thighs in QCAZ 3755. Marked sexual dichromatism exists in *Stenocercus chota* (Fig. 4C, D, E, F). Females have a cream ventral surface of body without markings (dark midventral stripe in males) and several large black spots in the gular region (absent in males). The sides of the head are gray with cream and black marks (sides of head white with gray marks in males). There is a longitudinal black stripe extending from the eye to a point that corresponds to the posterior border of the occipital region; another black stripe extends from the comisure to the tympanum (those stripes are absent in males). The dorsum usually is pale brown in both sexes.

Color in preservative: Ground color of dorsum of head and body dark brown or gray, dark brown transverse stripes on dorsum; rostrum white, cream, or gray; pale gray, venter reddish cream or cream in females; gular region of females with large black spots; dark midventral stripe and blue ventral marks indistinct or absent in males.

Table 3. Sexual variation in scutellation and measurements of *Stenocercus chota*. Range (first line), $x \pm$ SD (second line), and n (third line) are given.

Character	Females	Males
Scales around midbody	45–56	46–59
	50.62 ± 2.69	51.91 ± 4.25
	21	11
Vertebral scales	39–50	42–49
	45.20 ± 3.29	45.64 ± 2.58
	20	11
Paravertebral scales	55–71	58–74
	61.30 ± 4.56	64.64 ± 4.99
	20	11
Gular scales	18–23	19–23
	20.57 ± 1.57	20.64 ± 1.36
	21	11
Supraocular scales	4–6	5–6
	5.29 ± 0.56	5.36 ± 0.50
	21	11
Internasal scales	2–4	2–4
	3.38 ± 0.74	3.27 ± 0.65
	21	11
Subdigital lamellae of Finger IV	14–19	17–20
	17.14 ± 1.35	18.64 ± 1.03
	21	11
Subdigital lamellae of Toe IV	24–30	23–28
	26.05 ± 1.28	26.09 ± 1.45
	21	11
Headlength/head width	1.29–1.39	1.17–1.25
	1.29 ± 0.04	1.21 ± 0.03
	21	10
Head height/head width	0.76–0.94	0.77–0.90
	0.84 ± 0.05	0.84 ± 0.05
	21	10
Body height/body width	0.50–0.94	0.63–1.04
	0.69 ± 0.15	0.83 ± 0.13
	21	9
Regenerated tail length/tail length	0.59–3.07	0.55–0.63
	1.57 ± 1.00	0.26 ± 0.10
	6	2
Tail length/total length	0.58–0.65	0.55–0.63
	0.63 ± 0.02	0.61 ± 0.03
Maximum size (mm)	172	207

Natural history.—One female (QCAZ 3767) collected on 8 July 1997 contained two oviductal eggs. The sizes of these eggs are 16.59 × 7.81 mm and 15.95 × 7.67 mm; their volumes are 529.8 mm^3 and 491.3 mm^3, respectively. The smallest individual (QCAZ 902) was collected on 4 June 1989 and has a total length of 83 mm (SVL = 30 mm, TL = 53 mm).

Distribution and ecology.—*Stenocercus chota* is known from elevations of 1575–1940 m in the inter-Andean valley El Chota (Ibarra Basin) in northern Ecuador. It inhabits the upper valley of the Río Mira (Pacific Drainage) in Provincia Carchi and Provincia Imbabura (Fig. 6). Six specimens (EPN 5858–5860, 5862–5864), purportedly from Río Cachabí, Provincia Esmeraldas, were not used in the distribution analysis. Moreover, the upper valley of the Río Cachabí (Pacific Drainage) is approximately at 800 m about 55 km west of the closest locality confirmed for *S. chota* (La Concepción, Provincia Carchi, 00°35' N, 78°07' W, 1575 m). The distribution lies mainly within the Thorny Premontane Thicket, where the mean annual temperature is 18–24°C, and the mean annual precipitation is 250–500 mm.

Most individuals observed in the field were basking. These lizards escape by running directly into holes among stones, vegetation thickets, fallen logs, or branches, or they hide in the base of thorny shrubs. Specimens were found in undisturbed areas as well as very disturbed areas such as sugar cane plantations. A colubrid snake *Drymarchon corais* (QCAZ 3753), with the same collection data as the holotype of *Stenocercus chota*, contained a piece of tail and two eggs similar in shape and size to the eggs of *S. chota*.

Etymology.—The specific name is a noun in apposition and refers to the Chota Valley (Ibarra Basin), inhabited by this species.

Stenocercus festae (Peracca)

Liocephalus festae Peracca, 1897:6. QCAZ 4059, an adult male from Sevilla de Oro (02°48' S, 78°39' W), 2630 m, Provincia Azuay, Ecuador, collected on 17 September 1998 by P. Menéndez and P. Salazar, herein designated as neotype.

Leiocephalus ornatus ornatus (Part)—Burt and Burt, 1931:271.

Ophryoessoides festae—Etheridge, 1966:88.

Stenocercus festae—Fritts, 1974:49.

Comments on the neotype.—The description of *Stenocercus festae* was based on three specimens from Cuenca, Provincia Azuay (Peracca, 1897). Peters (1967) erroneously referred to specimen TurM (MZUT) 2619 as the holotype of *Stenocercus festae*. MZUT 2619 is a no longer valid number that corresponds to MZUT R2158.1-62, a series of 62 specimens reported by Peracca (1904) from La Concepción, Provincia Imbabura (Franco Andreone, pers. comm.). Peracca (1904) misidentified these specimens as *Stenocercus festae*; I checked them and they correspond to *Stenocercus chota*. According to Fritts (1974), the type material of *Stenocercus festae* corresponds to three syntypes deposited in the Torino Regional Museum of Natural History with unknown MZUT numbers. Nonetheless, the type material of *S. festae* cannot be located and a name-bearing type is necessary to define this taxon objectively.

Diagnosis.—(1) Maximum total length in males 241 mm (n = 10); (2) maximum total length in females 206 mm (n = 22); (3) vertebral scales 39–55; (4) scales around midbody 47–64; (5) internasal scales 2–4; (6) gular scales 16–29; (7) lamellae on Finger IV 14–22; (8) lamellae on Toe IV 21–33; (9) posthumeral pocket Type 2 or 3; (10) postfemoral pocket Type 3; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, keeled, juxtaposed; (14) ventral scales smooth or slightly keeled in adults and keeled in juveniles, imbricate; (15) scales on posterior surfaces of thighs keeled, imbricate; (16) antehumeral fold absent; (17) tail not or slightly compressed laterally; (18) gular region of males may be

black; (19) dorsum pale green.

Stenocercus festae differs from other species of *Stenocercus* by the combination of the following characters: smooth ventrals (slightly keeled in juveniles), imbricate scales on posterior surface of thigh, no enlarged supraoculars, posthumeral pocket Type 2 or 3, and postfemoral pocket Type 3.

Description of neotype.—Head higher than wide (HH/HW = 1.07); occipitals, parietals, interparietal, and postparietals small, keeled, and juxtaposed; 2 postrostrals; 4 internasals; 2 canthals, the most anterior in contact with the nasal; supraoculars keeled; enlarged supraoculars absent; lateral temporals keeled and slightly imbricate; parietal eye visible; gulars smooth and imbricate, bearing an apical pit; mental in contact with first pair of infralabials and first pair of postmentals.

Body wider than high (BH/BW = 0.99); dorsal and lateral scales of body and neck strongly keeled, imbricate, and mucronate; vertebrals large, forming a prominent serrate vertebral crest (Fig. 8); ventrals smooth and imbricate, bearing an apical pit; preauricular fringe nearly inconspicuous; neck folds absent; dorsal scales of hand, proximal ventral scales of forelimbs, and ventral scales of hind limbs smooth and imbricate; rest of limb scales imbricate and keeled; 22 lamellae on Finger IV; 31 lamellae on Toe IV; dorsal caudals keeled, imbricate, and mucronate; ventral caudals smooth and imbricate proximally and keeled and imbricate distally; tail length 70% of total length; posthumeral and postfemoral pockets Type 3.

Data on neotype: Male (Fig. 8); SVL = 81 mm; TL = 164 mm; HW = 14.32 mm; HL = 19.83 mm; HH = 15.39 mm; BW = 17.15 mm; BH = 17.11 mm; SM = 62; VS = 49; PS = 65; SS = 6; IS = 4; GS = 29; SF = 22; ST = 31.

Variation.—Measurements and scutellation of *Stenocercus festae* in Table 1. Head (Fig. 7B and D) usually wider than high (HH/HW = 0.75–1.16, $\bar{x} = 0.86 \pm 0.07$, $n = 42$); 2–3 postrostrals; 2–4 internasals, usually 4 (56%); parietal eye visible in 77% of the specimens; body usually wider than high (BH/BW = 0.63–1.18, $\bar{x} = 0.83 \pm 0.12$, $n = 31$); ventrals smooth or slightly keeled in adults and keeled in juveniles; 14–22 lamellae on Finger IV; 21–33 lamellae on Toe IV; tail length 52–71% of total length; posthumeral pocket Type 2 or 3, normally Type 3 (80%). Sexual variation in measurements and scutellation are given in Table 4.

Color in life: Dorsum of males grayish tan, grayish brown, or pale olive brown with roughly paired irregular green or yellow transverse stripes; flanks black with green or yellow flecks and blotches; antehumeral region black in some specimens; dorsal surfaces of limbs with yellow or green flecks or spots; supralabials and infralabials black; loreal and infraorbital scales yellowish green or yellow;

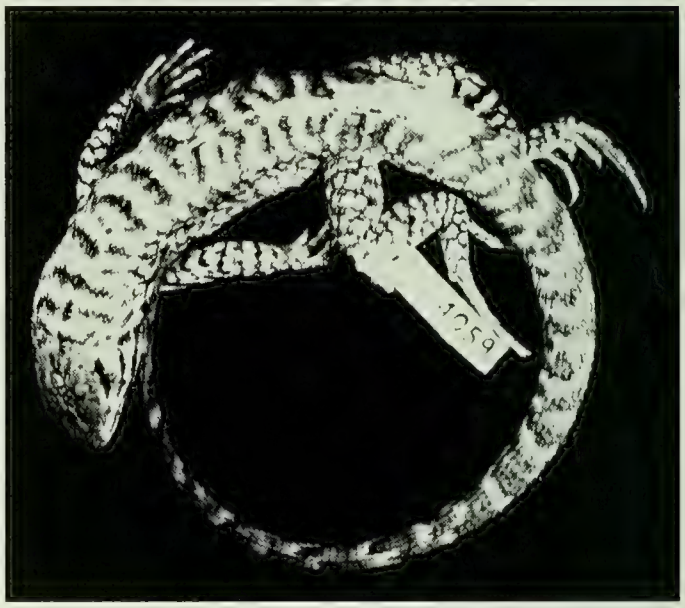


Fig. 8. *Stenocercus festae*, neotype, QCAZ 4059, male.

chin pale yellow or pale yellowish green; throat black; wide black midventral stripe; rest of venter yellowish green or pale yellow with black flecks; in some individuals, entire ventral surface of body black; in some specimens, anal region, ventral surfaces of hind limbs, and anterior ventral surface of tail yellow; ventral surface of thighs heavily suffused with black in some individuals; (Fig. 4H; Thomas H. Fritts, field notes, 5 and 8 June 1970). Dorsum of females brown with or without short dark transverse stripes on vertebral line; pale gray dorsolateral stripe present or not on each side; chin and chest yellow; venter pinkish white or pale yellow, rarely with gray flecks or blotches (Thomas H. Fritts, field notes, 5 and 20 June 1970). Juveniles have grayish-beige dorsum with numerous dark brown dorsal blotches; beige dorsolateral stripe on anterior half of body; whitish-beige infraorbital stripe; chin and venter pale gray with slight to extensive dark reticulation (Thomas H. Fritts, field notes, 8 and 20 June 1970).

Color in preservative: Dorsum in males dark brown or gray with dark brown transverse bars middorsally to tip of tail; black spot present or not on shoulder; limbs dark brown dorsally with or without black and cream reticulation; head dark brown, speckled with black in some individuals; supralabials and infralabials dark brown or black; black line extending from posterior border of orbit to tympanum; black spot behind eye; gular region usually white or cream, or with black spots; black band on throat; pectoral region cream speckled with black and brown; wide or narrow black midventral stripe; ventral surface of limbs and tail cream, with black or brown spots in some individuals. Dorsum of females dark brown or gray, with or

Table 4. Sexual variation in scutellation and measurements of *Stenocercus festae*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	48–63	47–64
	54.64 ± 4.15	56.6 ± 5.70
	22	10
Vertebral scales	39–55	43–53
	46.59 ± 4.06	47.30 ± 3.4
	22	10
Paravertebral scales	46–72	55–67
	62.00 ± 5.68	61.30 ± 4.74
	22	10
Gular scales	16–29	21–27
	22.27 ± 2.71	23.60 ± 1.96
	22	10
Supraocular scales	4–6	4–6
	5.05 ± 0.49	5.10 ± 0.57
	22	10
Internasal scales	2–4	2–4
	3.55 ± 0.67	3.40 ± 0.7
	22	10
Subdigital lamellae on Finger IV	14–22	15–21
	17.45 ± 1.82	17.44 ± 2.19
	22	9
Subdigital lamellae on Toe IV	21–33	24–30
	26.45 ± 2.63	26.56 ± 2.07
	22	9
Head length/head width	1.19–1.43	1.14–1.29
	1.30 ± 0.05	1.24 ± 0.05
	21	10
Head height/head width	0.75–0.95	0.77–1.16
	0.84 ± 0.04	0.89 ± 0.11
	21	10
Body height/body width	0.63–1.10	0.71–1.18
	0.80 ± 0.11	0.89 ± 0.16
	17	9
Regenerated tail length/tail length	0.27–2.24	0.66–4.14
	1.12 ± 0.96	2.08 ± 1.71
	5	4
Tail length/total length	0.52–0.71	0.63–0.67
	0.63 ± 0.06	0.65 ± 0.02
	11	4
Maximum size (mm)	206	241

without black spots; dorsum with several transverse bars that are wider and shorter than those of males; dorsal surface of limbs with dark brown or black spots but never reticulate as in males; venter cream with several short longitudinal gray flecks which can extend to gular region.

Distribution and ecology.—*Stenocercus festae* occurs at elevations of 2300–3200 m in the Cuenca and Saraguro Basins in southern Ecuador. It inhabits the upper valleys of the Río Paute (Atlantic Drainage) and Río Jubones (Pacific Drainage) in Provincia Azuay, Provincia Cañar and Provincia Loja (Fig. 6). The distribution lies within the Dry Low Montane Forest, Humid Montane Forest, and Subandean Humid Forest (= Subalpean Humid Forest of Cañadas-Cruz [1983]) life zones. The mean annual temperature in these zones is 12–18°C, 7–12°C, and 6–13°C, respectively. The mean annual precipitation is 500–1000 mm in the first two life zones and 250–500 mm in the third.

Stenocercus festae and *S. simonsii* occur in sympatry in the upper valley of the Río Jubones (Fritts, 1974). In this area, *S. festae* utilizes the leaves of agave plants and surrounding ground surface for basking and feeding, whereas *S. simonsii* is restricted to large rocks or rock piles (Fritts, 1974). Also, *S. festae* possibly occurs in sympatry with *S. rhodomelas* in the Saraguro Basin.

Stenocercus guentheri (Boulenger)

Liocephalus guentheri Boulenger 1885:169. Syntypes: BM 58.7.25.16–18; 59.9.20.6; 60.6.16.18–21; 71.2.7.7–10; 71.4.16.53; 80.12.8.53, from "Guayaquil [Provincia Guayas, Ecuador], Sarayacu [Provincia Pastaza] Ecuador, Western Ecuador, and Colombia" (restricted to San Antonio de Pichincha, 2500 m, Provincia Pichincha, by Fritts [1974]).

Leiocephalus ornatus ornatus (Part)—Burt and Burt, 1931:271.

Ophryoessoides guentheri—Etheridge, 1966:88.

Stenocercus guentheri—Fritts, 1974:54.

Comments on the type locality.—Fritts (1974) mentioned that *Stenocercus guentheri* occurs at none of the original type localities. However, Castro and Granados (1993) reported *S. guentheri* from southern Colombia. Fritts (1974) restricted the type locality to the Pichincha Basin (San Antonio de Pichincha) because some type specimens, one of which is the syntype herein described, have a black band on the throat, a character that has been found only in males from that basin.

Diagnosis.—(1) Maximum total length in males 255 mm (n = 38); (2) maximum total length in females 188 mm (n = 33); (3) vertebral scales 44–64; (4) scales around midbody 59–83; (5) internasal scales 2–4; (6) gular scales 21–31; (7) lamellae on Finger IV 15–23; (8) lamellae on Toe IV 22–36; (9) posthumeral pocket Type 1 or 2; (10) postfemoral pocket Type 1 or 2; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, wrinkled or keeled, juxtaposed; (14) ventral scales smooth, imbricate; (15) scales on posterior surfaces of thighs keeled, imbricate; (16) antehumeral fold absent; (17) tail not laterally compressed; (18) gular region of males not black; (19) dorsum bronzed-green, olive-green or brownish green.

Stenocercus guentheri is distinguished from other species of *Stenocercus* by the combination of smooth ventrals, imbricate scales on posterior surface of thigh, no enlarged supraoculars, posthumeral pocket Type 1 or 2, postfemoral pocket Type 1 or 2, and 59–83 scales around midbody.

Description of syntype BM 60.6.16.20.—Head wider than high (HH/HW = 0.88); occipitals , parietals, interparietal, and postparietals small, keeled, and juxtaposed; 4 postrostrals, each of which is longer than wide; 3

Table 4. Sexual variation in scutellation and measurements of *Stenocercus festae*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	48–63	47–64
	54.64 ± 4.15	56.6 ± 5.70
	22	10
Vertebral scales	39–55	43–53
	46.59 ± 4.06	47.3 ± 3.40
	22	10
Paravertebral scales	46–72	55–67
	62.00 ± 5.68	61.3 ± 4.74
	22	10
Gular scales	16–29	21–27
	22.27 ± 2.71	23.6 ± 1.96
	22	10
Supraocular scales	4–6	4–6
	5.05 ± 0.49	5.10 ± 0.57
	22	10
Internasal scales	2–4	2–4
	3.55 ± 0.67	3.40 ± 0.7
	22	10
Subdigital lamellae on Finger IV	14–22	15–21
	17.45 ± 1.82	17.44 ± 2.19
	22	9
Subdigital lamellae on Toe IV	21–33	24–30
	26.45 ± 2.63	26.56 ± 2.07
	22	9
Head length/head width	1.19–1.43	1.14–1.29
	1.30 ± 0.05	1.24 ± 0.05
	21	10
Head height/head width	0.75–0.95	0.77–1.16
	0.84 ± 0.04	0.89 ± 0.11
	21	10
Body height/body width	0.63–1.10	0.71–1.18
	0.80 ± 0.11	0.89 ± 0.16
	17	9
Regenerated tail length/tail length	0.27–2.24	0.66–4.14
	1.12 ± 0.96	2.08 ± 1.71
	5	4
Tail length/total length	0.52–0.71	0.63–0.67
	0.63 ± 0.06	0.65 ± 0.02
	11	4
Maximum size (mm)	206	241

internasals; 2 canthals on each side, the most anterior in contact with the nasal; supraoculars keeled; row of enlarged supraocular scales absent; lateral temporals keeled and imbricate; parietal eye visible; gulars smooth and imbricate; mental in contact with the first pair of infralabials and first pair of postmentals.

Dorsal and lateral scales of body and neck strongly keeled and imbricate; vertebrals large, forming a prominent serrate vertebral crest; ventrals smooth and imbricate; preauricular fringe poorly developed; neck folds absent; ventral scales of limbs smooth or slightly keeled, imbricate; dorsal scales of limbs, plantars, palmars, and scales on posterior surface of thighs keeled and imbricate; dorsal hand scales smooth and imbricate; 20 lamellae on Finger IV; 31 lamellae on Toe IV; tail slightly compressed; dorsal and lateral scales of tail keeled, imbricate, and slightly mucronate; anterior ventral scales of tail smooth and imbricate; posterior ventral scales of tail keeled and imbricate; vertebral crest extending more than half the length of the tail; tail length 62% of total length; posthumeral and postfemoral pockets Type 2.

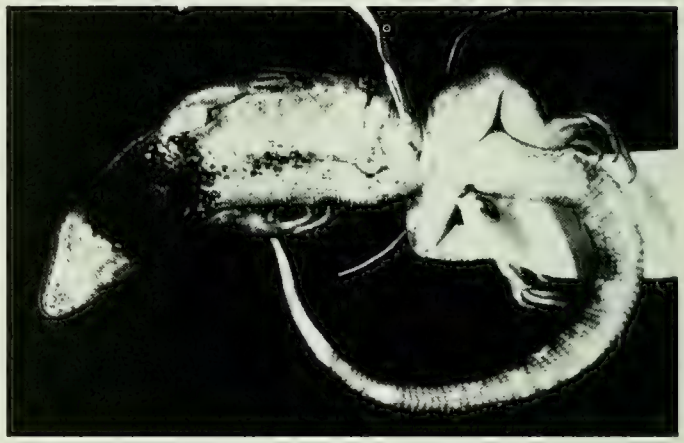


Fig. 9. *Stenocercus guentheri*, syntype, BM 60.6.16.20, male.

Data on syntype BM 60.6.16.20: Male (Fig. 9); SVL = 96 mm; TL = 159 mm; HW = 17 mm; HL = 20.3 mm; HH = 15 mm; SM = 69; VS = 59; PS = 89; SS = 6; IS = 3; GS = 26; SF = 20; ST = 31.

Variation.—Measurements and scutellation of *Stenocercus guentheri* in Table 1. Head (Fig. 10A and C) usually wider than high (HH/HW = 0.75–1.05, $\bar{x} = 0.87 \pm 0.07$, $n = 72$); usually 2 postrostrals (58%, 3 in 28%, 4 in 14%), each wider than long; 2–4 internasals (usually 4, 50%); anteriormost canthals seldom (12%) separated from the nasals by one or two tiny scales; parietal eye usually visible (80%); gulars bearing apical pit in (98%); mental in contact with a tiny scale (20%) that medially separates first pair of postmentals; body usually wider than high (BH/BW = 0.50–1.15, $\bar{x} = 0.81 \pm 0.14$, $n = 68$); ventrals weakly keeled in 45% of the specimens; vertebral crest most conspicuous in adult males; 15–23 lamellae on Finger IV; 22–36 lamellae on Toe IV; tail not or slightly compressed; vertebral crest extending more than half the length of the tail only in adult males; tail length 57–72% of total length; posthumeral and postfemoral pockets Type 1 or 2. Sexual and geographic variation in scutellation and measurements among samples of *S. guentheri* in Tables 5 and 6, respectively.

Color in life: An adult male (QCAZ 3761) from 7.5 km N Otavalo, Provincia Imbabura: dorsum of head, body, limbs, and tail pale olive-green; several irregular small black transverse bars on vertebral line; numerous pale green scales on flanks and dorsal surfaces of limbs; irregu-

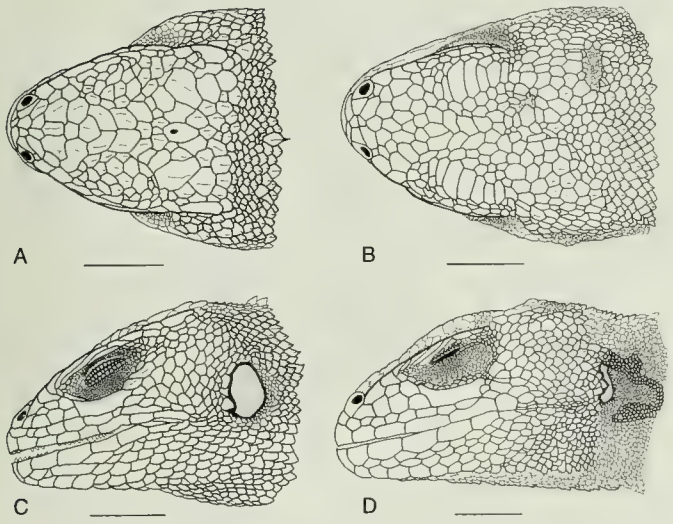


Fig. 10. Dorsal and lateral views of the heads of two species of *Stenocercus*. A and C *S. guentheri*, QCAZ 775, male. B and D *S. haenschi*, holotype, ZMB 16595, male. Scale bars = 5 mm.

lar black transverse lines on dorsal surface of hind limbs; iridescent pale green gular region; ventral surfaces of body and limbs also pale green, but less iridescent; ventral surfaces of thighs and anal region pale yellow; ventral surface of tail pale yellow proximally and dark yellow distally. Another adult male (QCAZ 4108) from Lloa, Provincia Pichincha, differs noticeably from the former in the following characters: dorsum of head dark brown; dorsum of body, limbs and tail dark greenish brown; several small yellow transverse marks on vertebral line and small yellow dots on flanks and dorsal surface of limbs; one dorsolateral black stripe on each side extending from the superior edge of tympanum to the base of tail; gular region dark brown, with several yellowish-brown flecks; throat black with small yellow flecks; throat pale yellow with dark brown flecks; dark brown longitudinal midventral stripe extending from throat to point before the insertion of hind limbs; ventral surface of body on each side of midventral stripe bluish gray with several white irregular marks; ventral surface of forelimbs and tail dark brown with yellow marks, distal portion of tail with pink marks (Fig. 5C). An adult female (QCAZ 3659) from 14.5 km N Tixán, Provincia Chimborazo: dorsum dark olive-green with scattered small black spots; short transverse black bars on vertebral line; region between flanks and venter intense yellow with several dark olive-green spots; pale yellow venter with small gray flecks in gular region. A female (QCAZ 3660) from the same locality differs from the former by having whitish-cream venter and small gray flecks in mental, gular, and pectoral regions.

Color in preservative: Dorsum of head and body in males dark brown, reddish-brown, greenish-brown, or gray;

Table 5. Sexual variation in scutellation and measurements of *Stenocercus guentheri*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	59–82	60–83
	67.27 ± 4.49	68.79 ± 5.25
	33	38
Vertebral scales	46–64	46–63
	55.67 ± 3.80	55.34 ± 3.45
	33	38
Paravertebral scales	63–89	59–89
	74.00 ± 5.40	74.74 ± 6.42
	33	38
Gular scales	21–31	22–30
	25.27 ± 2.15	25.89 ± 2.09
	33	38
Supraocular scales	5–7	5–7
	5.61 ± 0.61	5.84 ± 0.49
	33	38
Internasal scales	2–4	2–4
	3.27 ± 0.88	3.24 ± 0.82
	33	38
Subdigital lamellae on Finger IV	16–22	15–23
	17.76 ± 1.28	18.66 ± 1.74
	33	38
Subdigital lamellae on Toe IV	22–34	23–36
	26.88 ± 2.55	27.92 ± 2.27
	32	38
Head length/head width	1.13–1.35	1.10–1.33
	1.27 ± 0.04	1.26 ± 0.06
	32	38
Head height/head width	0.75–1.01	0.79–1.05
	0.85 ± 0.06	0.89 ± 0.07
	32	37
Body height/body width	0.50–1.03	0.59–1.15
	0.78 ± 0.13	0.84 ± 0.14
	31	34
Regenerated tail length/tail length	0.58–3.40	0.11–3.00
	2.09 ± 1.16	1.44 ± 0.90
	4	9
Tail length/total length	0.57–0.72	0.58–0.68
	0.63 ± 0.03	0.65 ± 0.02
	25	25
Maximum size (mm)	188	255

small black spots on head in 34% of specimens; black band (incomplete medially in 20%) on throat of 56% of the males from Machachi, San Antonio, Quito, Uyumbicho, and Tabacundo (Fritts [1974] referred to this black band as "black patches on the gular region" and he mentioned that these patches can be found only in populations of the Pichincha Basin); gular region gray, reddish cream, or cream; dorsum and flanks with several small cream, bluish-green or pale blue spots (92%); short dark transverse bars on vertebral line of body and tail (73%); dark transverse lines on dorsal surfaces of limbs (86%); ventral surfaces of body, limbs, and tail, reddish cream, cream, or gray. Dorsum of head and body in females greenish-brown, brown, or pale gray; short transverse dark bars on verte-

Table 6. Geographic variation in scutellation and measurements of *Stenocercus guentheri*. Range (first line), $\bar{x} \pm$ SD (second line) and *n* (third line) are given.

Character	Palmira, Chimborazo	Guayllabamba, Pichincha	Machachi, Pichincha	Quito, Pichincha	San Antonio, Pichincha	Picaihua, Tungurahua
Scales around midbody	68–72	64–70	59–70	59–74	60–74	67–83
	69.67 ± 2.08	67.00 ± 2.58	66.00 ± 3.16	67.50 ± 5.32	67.63 ± 3.80	75.33 ± 8.02
	3	4	9	6	24	3
Vertebral scales	46–56	53–56	54–57	53–61	53–64	56–63
	52.00 ± 5.29	54.00 ± 1.41	54.67 ± 1.00	56.67 ± 3.20	56.63 ± 2.83	60.33 ± 3.79
	3	4	9	6	24	3
Paravertebral scales	63–68	71–78	71–81	69–86	70–85	73–82
	65.33 ± 2.52	73.75 ± 3.10	75.33 ± 3.35	75.83 ± 5.91	76.38 ± 2.98	76.33 ± 4.93
	3	4	9	6	24	3
Gular scales	25–27	21–29	23–28	24–31	22–30	26–30
	26.00 ± 1	24.25 ± 3.40	25.11 ± 1.62	26.33 ± 2.73	25.83 ± 2.14	27.33 ± 2.31
	3	4	9	6	24	3
Supraocular scales	5–6	5–7	5	5–6	6–7	6–7
	5.33 ± 0.58	5.75 ± 0.96	—	5.50 ± 0.55	6.04 ± 0.20	6.67 ± 0.58
	3	4	9	6	24	3
Internasal scales	4	3–4	3–4	2–4	2–4	4
	—	3.50 ± 0.58	3.78 ± 0.44	3.67 ± 0.82	2.58 ± 0.72	—
	3	4	9	6	24	3
Subdigital lamellae on Finger IV	16–18	17–20	16–19	16–18	16–21	19–22
	17.00 ± 1.00	18.50 ± 1.29	17.11 ± 0.93	17.50 ± 0.84	18.71 ± 1.30	20.33 ± 1.53
	3	4	9	6	24	3
Subdigital lamellae on Toe IV	22–24	27–28	24–29	24–29	24–31	29
	23.33 ± 1.15	27.25 ± 0.50	25.67 ± 1.80	27.00 ± 1.79	28.17 ± 1.74	—
	3	4	9	6	24	3
Head length/head width	1.13–1.21	1.27–1.31	1.19–1.33	1.22–1.25	1.22–1.35	1.23–1.29
	1.18 ± 0.04	1.29 ± 0.02	1.25 ± 0.04	1.24 ± 0.01	1.29 ± 0.03	1.26 ± 0.03
	3	4	9	5	23	3
Head height/head width	0.75–0.81	0.78–1.01	0.78–0.93	0.76–1.05	0.79–1.05	0.81–0.88
	0.77 ± 0.03	0.90 ± 0.10	0.88 ± 0.05	0.89 ± 0.11	0.88 ± 0.07	0.84 ± 0.03
	3	4	9	5	23	3
Body height/body width	0.59–0.67	0.69–0.86	0.69–1.15	0.62–0.99	0.50–1.01	0.75–0.79
	0.62 ± 0.04	0.76 ± 0.09	0.89 ± 0.14	0.85 ± 0.17	0.80 ± 0.14	0.78 ± 0.03
	3	4	9	5	23	3
Regenerated tail length/tail length	2.05	3	—	1.35	0.16–2.33	2.09
	—	—	—	—	1.15 ± 0.98	—
	1	1	—	1	4	1
Tail length/total length	0.63	0.60–0.65	0.59–0.67	0.63–0.72	0.57–0.67	0.62–0.63
	—	0.63 ± 0.02	0.63 ± 0.02	0.65 ± 0.05	0.64 ± 0.03	0.63 ± 0.01
	1	3	9	4	17	2
Maximum size (mm)	144	166	234	215	215	169

bral line of body and tail (75%); dark transverse lines on dorsal surfaces of limbs (65%); small black spots on head (90%); three parallel black lines on each side of the head (75%), one extending from angle of mouth to inferior edge of tympanum, other extending from inferior border of the orbit to superior edge of tympanum, one from posterior edge of orbit to neck; loreal region cream (85%) or pale brown; venter greenish cream, blue-cream, or cream; gular region normally with reticulate gray or dark brown flecks; small dark flecks on venter (80%).

Natural history.—One female (QCAZ 713) collected on 17 June 1989 contained two oviductal eggs. The sizes of these eggs are 19.7 mm × 10.2 mm and 19.3 mm × 10.3 mm; their volumes are 1071.1 mm^3 and 1078.2 mm^3, respectively. The smallest individual (QCAZ 737) was collected on 5 June 1988 and has a total length of 72 mm (SVL = 20 mm, TL = 52 mm). Fritts (1974) reported one female covering a small hole containing two eggs on 11 June 1970 near Guamote (Provincia Chimborazo) and 18 females that deposited two eggs each in the laboratory between 16 May and 18 June 1972.

Distribution and ecology.—*Stenocercus guentheri* occurs at elevations of 2135–3890 m in the Ecuadorian Andes, especially in the Cordillera Occidental and the Alausí, Latacunga, Otavalo, Quito, and Riobamba inter-Andean basins (Fig. 11). It inhabits the upper valleys of several rivers of the Pacific (Río Mira, Río Esmeraldas, and Río Guayas) and Atlantic (Río Pastaza and Río Paute) drain-

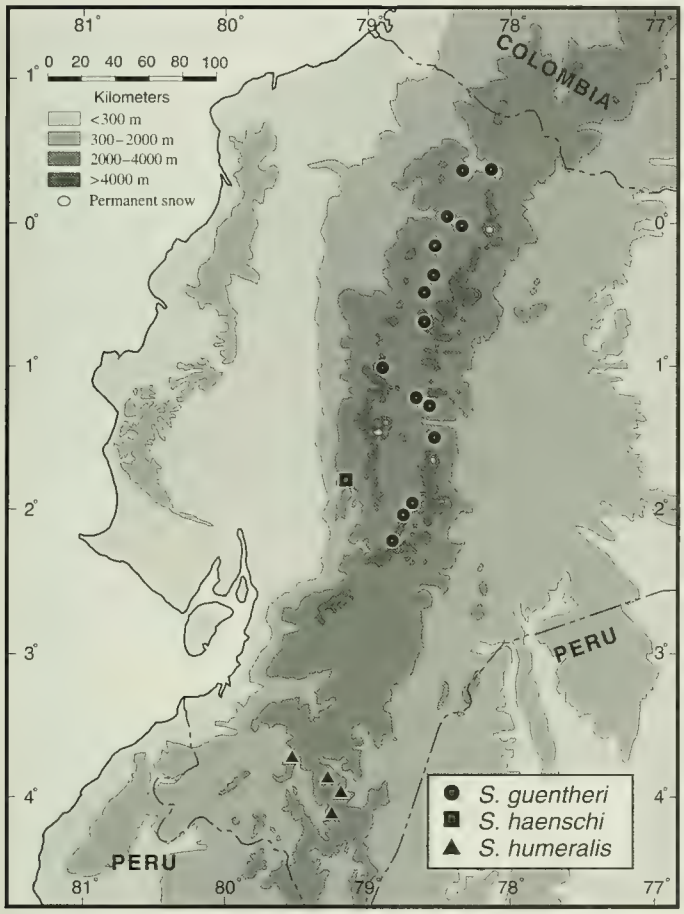


Fig. 11. Distribution of three species of *Stenocercus* in Ecuador.

ages in the following Provincias: Chimborazo, Cotopaxi, Imbabura, Pichincha, and Tungurahua. The distribution lies within the Low Humid Montane Forest, Low Dry Montane Forest, Low Thorny Montane Steppe, and Montane Steppe life zones. The mean annual temperature is 12–18°C in the former three life zones and 7–12°C in the fourth. The mean annual precipitation is 1000–2000 mm in Low Humid Montane Forest, 500–1000 mm in Low Dry Montane Forest, and 250–500 mm in the latter two zones.

Fritts (1974) gave Sevilla de Oro (02°48' S, 78°39' W, 2630 m; Provincia Azuay) as the southernmost locality for *Stenocercus guentheri*. However, I examined two of the specimens from Sevilla de Oro that Fritts (1974) checked (JAP 6522, 6525, 6527, 6528, 6530, USNM 201222, 201223) and they correspond to *S. festae*. Furthermore, the neotype of *S. festae* was collected in Sevilla de Oro.

Stenocercus guentheri also has been reported from the Andes of southern Colombia (Ayala and Castro, 1982; Castro and Granados, 1993; Corredor, 1983), where it occurs at elevations of 2000–3900 m in departamentos of Nariño and Cauca (Castro and Granados, 1993).

Males tend to occupy rocks and other elevated positions for basking and feeding, whereas females prefer the ground (Fritts, 1974). At localities lacking exposed rocks or rock walls, both sexes seek refuge in holes in the ground at the bases of plants such as *Agave* and *Stipa* (Fritts, 1974). De Vries et al. (1983) reported *S. guentheri* as one of the main prey items of the Andean falcon *Phalcoboenus carunculatus* (Carunculated Caracara).

Remarks.—Fritts (1974) described some of the considerable geographic variation in *Stenocercus guentheri*. He noted that the number of scales around midbody is higher in some populations in the Cotopaxi and Chimborazo Basins than in those in the Imbabura and Pichincha Basins. Fritts (1974) also mentioned that males from the Imbabura and Pichincha Basins have a narrow yellow midventral stripe with lateral areas of venter bluish to greenish gray, whereas males from the Cotopaxi and Chimborazo Basins have yellow venters with numerous dark spots, and the population from Alausí (southern Chimborazo Basin) includes males with reddish-orange, pale yellow, or bluish-green venters. However, a specimen (QCAZ 4153) from Pusuquí (Pichincha Basin) has a reddish-orange venter with a yellow midventral stripe (Fig. 5A, B), and a specimen (QCAZ 4108) from Lloa (Pichincha Basin) has a dark brown midventral stripe (Fig. 5C). Males from Colombia (departamentos Nariño and Cauca) have a cream venter with scattered brown marks (Castro and Granados, 1993). The Cotopaxi, Chimborazo, Imbabura, and Pichincha Basins respectively correspond to the Latacunga, Riobamba, Otavalo, and Quito Basins mentioned by Duellman (1979). *Stenocercus guentheri* is probably a species complex because of the considerable geographic variation (especially color patterns of males). However, clarification of the taxonomic status of the populations of this species requires further collection and study.

Stenocercus haenschi (Werner)

Liocephalus formosus Boulenger, 1880:43. Holotype: MRHN 2007 from "Andes of Ecuador" (restricted to Balsapamba, 750 m, Provincia Bolívar, Ecuador, by Fritts [1974]). Replacement of the name *Liocephalus formosus* with the junior synonym *Liocephalus haenschi* was necessary because *L. formosus* became a junior secondary homonym of *Scelotrema formosum* when both taxa were combined into *Stenocercus*. Synonymy fide Fritts, 1974:55.

Liocephalus haenschi Werner, 1901:595. Holotype: ZMB 16595 from "Balsapamba [Provincia Bolívar], 750 m, Ecuador".

Ophryoessoides haenschi—Etheridge, 1966:88.

Stenocercus haenschi—Fritts, 1974:55.

Diagnosis.—(1) Maximum SVL in males 76 mm; (2) unknown; (3) vertebral scales 50; (4) scales around midbody 57–66; (5) internasal scales 3; (6) gular scales 56; (7) lamellae on Finger IV 26–28; (8) lamellae on Toe IV 30; (9) posthumeral pocket Type 2; (10) postfemoral pocket Type 2; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small,

wrinkled, juxtaposed; (14) ventral scales smooth, imbricate; (15) scales on posterior surfaces of thighs granular; (16) antehumeral fold present; (17) tail not laterally compressed; (18) gular region in males not black; (19) dorsum bluish green.

Stenocercus haenschi differs from other species of *Stenocercus* by the combination of smooth ventrals, granular scales on posterior surface of thigh, no enlarged supraoculars, no vertebral crest, 3 caudal whorls per autotomic segment, caudals not mucronate, posthumeral pocket Type 2, postfemoral pocket Type 2, and 26–28 lamellae on Finger IV.

Description of holotype.—Head (Fig. 10B and D) wider than high (HH/HW = 0.86); occipitals, parietals, interparietal, and postparietals small, wrinkled, and juxtaposed; 3 internasals; 2 canthals, the most anterior in contact with the nasal; supraoculars smooth; 1 row of supraocular scales more than twice size of scales in adjacent rows; lateral temporals small, keeled, juxtaposed; parietal eye not visible; gulars smooth and imbricate; mental in contact with first pair of infralabials and first pair of postmentals.

Body wider than high (BH/BW = 0.80); dorsal scales of neck and body keeled and imbricate; lateral scales of neck granular; lateral scales of body keeled, imbricate, decreasing to less than one half size of dorsals laterally; vertebrals inconspicuous, not forming crest; ventrals smooth, imbricate, same size as largest dorsals; preauricular fringe well developed; antegular, gular, longitudinal neck, oblique neck, postauricular, rictal, and ventrolateral folds present; palmars, plantars, and dorsal scales of forelimbs and hind limbs keeled, imbricate; dorsal scales of hands and ventral scales of hind limbs smooth, imbricate; scales on posterior surface of thighs granular; 28 lamellae on Finger IV; 30 lamellae on Toe IV; tail not compressed; all caudals keeled and imbricate except scales of anterior ventral surface smooth and imbricate; posthumeral and postfemoral pockets Type 2. Tail of holotype broken; therefore, TL/ToL not estimated.

In life, the holotype had the following color features: dorsum bluish green; flanks grayish green with small pale green spots; large black mark on each shoulder; irregular dark transverse stripes on limbs; dorsum of head pale olive-brown; gular region grayish green with pale spots; venter bluish green; dorsal surface of tail brown with dark transverse bands; ventral surface of tail gray with narrow pale transverse bands (Werner, 1901).

The preserved holotype has the following color features: dorsum and flanks bluish gray; flanks, lateral neck surfaces and gular region speckled with several small white spots; large rhomboidal mark in front of each shoulder; ventral surface gray; dorsal surface of tail greenish gray; ventral surface of tail cream with irregular greenish-gray marks.

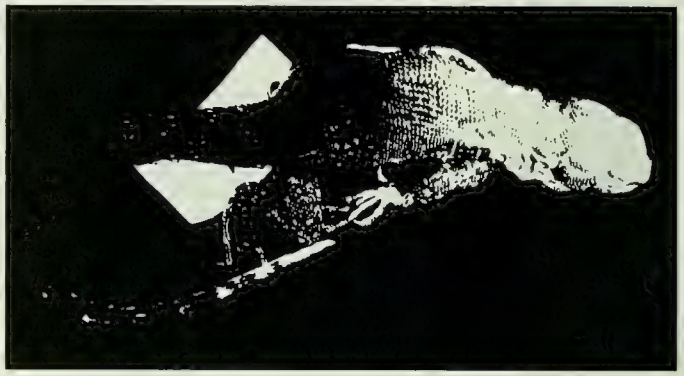


Fig. 12. *Stenocercus haenschi*, holotype, ZMB 16595, male.

Data on holotype: Male (Fig. 12); SVL = 76 mm; HW = 14.7 mm; HL = 19.7 mm; HH = 12.6 mm; BW = 19.8 mm; BH = 15.9 mm; SM = 66; VS = 50; PS = 64; SS = 5; IS = 3; GS = 56; SF = 28; ST = 30.

Distribution and ecology.—*Stenocercus haenschi* is known only from the type locality (Balsapamba, Provincia Bolívar) at 750 m on the western slopes of the Cordillera Occidental, (Fig. 11). This locality is in the upper valley of the Río Babahoyo (Pacific Drainage), within the Humid Premontane Forest, where the mean annual temperature is 18–24°C and the mean annual precipitation is 1000–2000 mm.

Remarks.—Except for the type material (MRHN 2007 and ZMB 16595), no specimens of *Stenocercus haenschi* have been collected. I visited the type locality (Balsapamba, Provincia Bolívar) in June 1997 but found no specimens. Natural vegetation of Balsapamba has been replaced mostly by orange, banana, and coffee plantations. Possibly, the population of this species has been severely affected by human activities. More exhaustive collections at the type locality are necessary to address the population status of *Stenocercus haenschi*.

Stenocercus humeralis (Günther)

Microphractus humeralis Günther, 1859a:90. Syntypes: BM 1946.8.11.76–77, from "Andes of Ecuador" (restricted to Loja, 2150 m, Provincia Loja, Ecuador, by Fritts [1974]).

Stenocercus humeralis—Peters, 1967:34.

Diagnosis.—(1) Maximum total length in males 301 mm (n = 17); (2) maximum total length in females 272 mm (n = 16); (3) vertebral scales 81–102; (4) scales around midbody 98–119; (5) internasal scales 2–4; (6) gular scales 43–68; (7) lamellae on Finger IV 24–33; (8) lamellae on Toe IV 28–40; (9) posthumeral pocket Type 1 or 2; (10) postfemoral pocket Type 3; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital

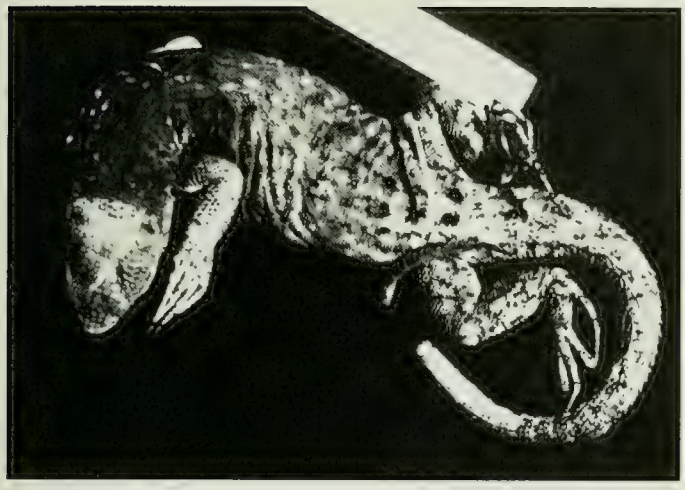


Fig. 13. *Stenocercus humeralis*, syntype, BM 1946.8.11.76, female.

scales small, smooth, juxtaposed; (14) ventral scales smooth, imbricate; (15) scales on posterior surfaces of thighs granular; (16) antehumeral fold present; (17) tail not laterally compressed; (18) gular region of males not black; (19) dorsum bluish green or brownish green.

Stenocercus humeralis is distinguished from other species of *Stenocercus* by the combination of smooth ventrals, granular scales on posterior surface of thigh, 3 caudal whorls per autotomic segment, caudals not mucronate, posthumeral pocket Type 1 or 2, postfemoral pocket Type 3, 98–119 scales around midbody, 24–33 lamellae on Finger IV, and 81–102 vertebral scales.

Description of syntype BM 1946.8.11.76.—Head wider than high (HH/HW = 0.76); occipitals, parietals, interparietal, and postparietals small, smooth, and juxtaposed; 4 postrostrals, the 2 innermost longer than wide; 4 internasals; 2 canthals on each side, most anterior separated from nasal by tiny scales; supraoculars smooth; enlarged supraoculars absent; lateral temporals smooth and small, approximately half size of dorsal head scales; parietal eye not visible; gulars smooth, imbricate; mental in contact with first pair of infralabials and first pair of postmentals.

Dorsal and lateral scales of neck granular; dorsal scales of body imbricate, slightly keeled, becoming gradually granular toward flanks; vertebral crest nearly inconspicuous; ventrals smooth, imbricate; preauricular fringe poorly developed; antehumeral, gular, antegular, longitudinal neck, oblique neck, rictal, postauricular, supra-auricular, dorsolateral, and ventrolateral folds present; dorsal scales of forelimbs and hind limbs keeled, imbricate; ventral scales of forelimbs granular proximally, smooth and imbricate distally; ventral scales of hind limbs smooth, imbricate; palmar and plantar scales slightly keeled, imbricate; scales on posterior surface of thighs granular; 24 lamellae on Finger IV; 28 lamellae on Toe IV; tail not compressed; caudals keeled, imbricate; tail length 57% of total length; posthumeral pocket Type 1; postfemoral pocket Type 3.

Table 7. Sexual variation in scutellation and measurements of *Stenocercus humeralis*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	98–119	100–119
	106.69 ± 6.22	109.65 ± 5.74
	16	17
Vertebral scales	81–101	83–102
	91.13 ± 6.37	90.76 ± 5.82
	15	17
Paravertebral scales	106–145	114–140
	126.53 ± 9.21	128.29 ± 6.44
	15	17
Gular scales	43–68	45–56
	49.25 ± 5.63	49.82 ± 3.15
	16	17
Supraocular scales	6–7	6–8
	6.88 ± 0.34	7.06 ± 0.56
	16	17
Internasal scales	3–4	2–4
	3.94 ± 0.25	3.82 ± 0.53
	16	17
Subdigital lamellae on Finger IV	24–33	26–31
	29.06 ± 2.35	29.29 ± 1.57
	16	17
Subdigital lamellae on Toe IV	28–40	34–40
	36.56 ± 3.14	37.19 ± 1.72
	16	16
Head length/head width	1.25–1.43	1.15–1.35
	1.31 ± 0.05	1.26 ± 0.06
	16	17
Head height/head width	0.67–0.93	0.70–0.88
	0.78 ± 0.07	0.78 ± 0.05
	16	17
Body height/body width	0.56–0.90	0.61–0.89
	0.70 ± 0.1	0.71 ± 0.07
	13	15
Regenerated tail length/tail length	1.74	1.58–3.84
	—	2.67 ± 0.8
	1	5
Tail length/total length	0.63–0.67	0.62–0.68
	0.65 ± 0.01	0.66 ± 0.02
	13	11
Maximum size (mm)	272	301

Data on syntype BM 1946.8.11.76: Female (Fig. 13); SVL = 76; TL = 101 mm; HW = 13.3 mm; HL = 17.1 mm; HH = 10.1 mm; SM = 119; VS = 82; PS = 131; SS = 7 (right side), 8 (left side); IS = 4; GS = 68; SF = 24; ST = 28.

Variation.—Measurements and scutellation of *Stenocercus humeralis* in Table 1. Head (Fig. 14A and C) wider than high (HH/HW = 0.67–0.93, $\bar{x} = 0.78 \pm 0.06$, $n =$ 34); 2–4 internasals, usually 4 (91% of specimens); canthals separated from nasals by 1 or 2 tiny scales (73%); mental in contact with small scale between the first pair of

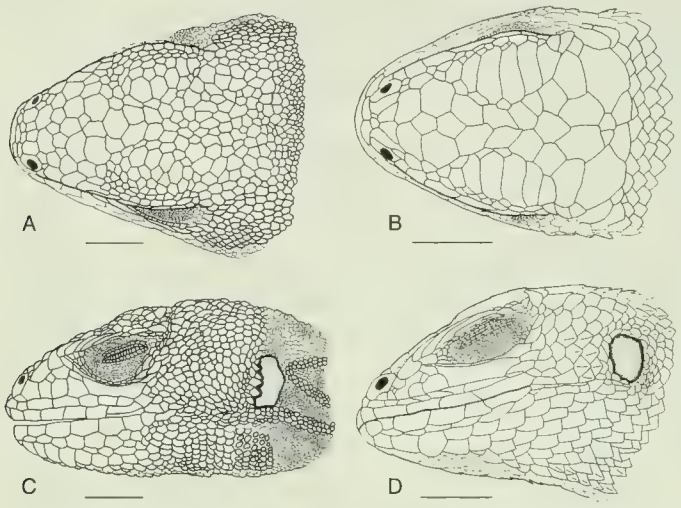


Fig. 14. Dorsal and lateral views of the heads of two species of *Stenocercus*. A and C *S. humeralis*, EPN 5828, female. B and D *S. iridescens*, QCAZ 3322, female. Scale bars = 5 mm.

postmentals in 37 % of specimens; body wider than high (BH/BW = 0.56–0.90, $\bar{x} = 0.70 \pm 0.08$, $n = 28$); 24–33 lamellae on Finger IV; 28–40 lamellae on Toe IV; tail length 57–68% of total length; posthumeral pocket Type 1 or 2. Sexual variation in scutellation and measurements of *S. humeralis* is presented in Table 7.

Color in life: Dorsum in males (Fig. 5D) yellow-green with a few transverse rows of yellow spots extending onto flanks; black dorsal and lateral collar extending to insertion of forearm on each side; venter pale yellow (Thomas H. Fritts, field notes, 28 June 1970). Dorsum and flanks in females yellowish green; scattered black flecks on dorsum; chin and gular region pale yellowish green; ventral surface of body and limbs pale yellow; subcaudal region beige (Thomas H. Fritts, field notes, 26 and 27 June 1970). Dorsum in juveniles yellowish beige or pale brown; transverse black bars on vertebral line; black flecks and blotches might be present on dorsum; chin and venter yellow (Thomas H. Fritts, field notes, 28 June 1970).

Color in preservative: Dorsum with several dark short transverse bars on vertebral line; black transverse stripe across dorsum between shoulders; ground color of head, body and tail gray; ventral surfaces cream, reddish cream, or pale gray.

Natural history.—One female (EPN 5829) collected in December 1968 contained four oviductal eggs, two in each oviduct. Mean size of these eggs is 17.83 mm × 10.74 mm. Mean volume of the eggs is 1076.9 mm^3. The smallest individual (FHGO 1495), collected on 14 October 1996, has a total length of 118 mm (SVL = 40 mm, TL = 78 mm).

Distribution and ecology.—*Stenocercus humeralis* occurs at elevations of 2000–3000 m in the Loja Basin in southern Ecuador. It inhabits the upper valleys of the Río Catamayo (Pacific Drainage) and Río Zamora (Atlantic Drainage) in Provincia Loja (Fig. 11). The distribution lies within the Dry Low Montane Forest and Humid Premontane Forest. The mean annual temperature in these zones is 12–18°C and 18–24°C, respectively. The mean annual precipitation is 500–1000 mm in the former and 1000–2000 mm in the latter.

Stenocercus humeralis and *S. ornatus* occur in sympatry in the upper valley of the Río Zamora; *S. humeralis* is abundant on small shrubs and trunks of eucalyptus trees in mesic valleys, as well as on agave plants and top of fences, whereas *S. ornatus* is confined to more open habitats at bases of shrubs and in low rows of agave (Fritts, 1974).

Stenocercus iridescens (Günther)

Liocephalus iridescens Günther, 1859b:409. Syntypes: BM 60.6.16.2–7, from "Andes of western Ecuador."
Leiocephalus iridescens iridescens (Part)—Burt and Burt, 1931:269.
Ophryoessoides iridescens—Etheridge, 1966:88.
Stenocercus iridescens—Frost, 1992:43.

Diagnosis.—(1) Maximum total length in males 294 mm ($n = 17$); (2) maximum total length in females 213 mm ($n = 16$); (3) vertebral scales 40–52; (4) scales around midbody 35–52; (5) internasal scales 2–4; (6) gular scales 16–20; (7) lamellae on Finger IV 15–18; (8) lamellae on Toe IV 22–28; (9) posthumeral pocket Type 1 or 2; (10) postfemoral pocket Type 1; (11) projecting angulate temporals absent; (12) one row of enlarged supraoculars, more than twice size of scales in adjacent rows; (13) occipital scales large, smooth, slightly imbricate; (14) ventral scales keeled, imbricate; (15) scales on posterior surfaces of thighs keeled, imbricate; (16) antehumeral fold absent; (17) tail strongly compressed laterally; (18) gular region of males black; (19) dorsum brownish green or brownish blue in males and dark brown in females.

Stenocercus iridescens differs from other species of *Stenocercus* by the combination of the following characters: keeled ventrals, large and smooth occipital scales, one row of enlarged supraoculars more than twice the size of scales in adjacent rows, two canthal scales, posthumeral pocket Type 1 or 2, postfemoral pocket Type 1, absence of dorsolateral crest, and absence of projecting angulate temporals.

Description of syntype BM 60.6.16.2.—Head wider than high (HH/HW = 0.90); occipitals, parietals, interparietal, and postparietals large, smooth, slightly imbricate; 2 postrostrals, wider than long; 2 internasals; 2 canthals on each side, most anterior one separated from nasal by tiny scales; supraoculars smooth, slightly imbricate, 1 row being more than twice size of scales in adjacent rows; lateral temporals imbricate, slightly keeled; parietal eye visible; gulars imbricate, slightly keeled, each bearing apical

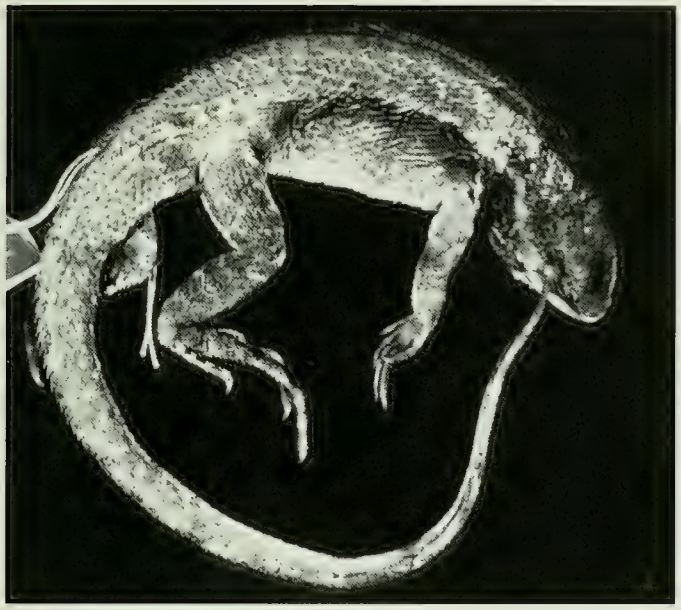


Fig. 15. *Stenocercus iridescens*, syntype, BM 60.6.16.2, male.

pit; mental in contact with first pair of infralabials and first pair of postmentals.

Dorsal and lateral scales of body and neck keeled, imbricate; vertebrals large, forming prominent serrate vertebral crest; ventrals keeled, imbricate; preauricular fringe absent; neck folds absent; limb scales keeled, imbricate; ventral scales of hind limbs smooth or slightly keeled; 15 lamellae on Finger IV; 27 lamellae on Toe IV; tail strongly compressed; all caudals keeled, imbricate; vertebral crest extending more than half length of tail; tail length 65% of total length; posthumeral pocket Type 2; postfemoral pocket Type 1.

Data on syntype BM 60.6.16.2: Male (Fig. 15); SVL = 82 mm; TL = 155 mm; HW = 14 mm; HL = 17.8 mm; HH = 12.6 mm; SM = 49; VS = 51; PS = 57; SS = 4; IS = 2; GS = 20; SF = 15; ST = 27.

Variation.—Measurements and scutellation of *Stenocercus iridescens* in Table 1. Head (Fig. 14B and D) normally wider than high (HH/HW = 0.72–1.04, $\bar{x}$ = 0.88 ± 0.07, n = 42); 1 or 2 postrostrals, wider than long; 2–4 internasals, usually 2 (60% of the specimens); parietal eye visible in 79% of the specimens; gulars bearing an apical pit in 91% of the specimens; postmentals in contact medially or separated by a tiny scale (11% of the specimens); body generally wider than high (BH/BW = 0.66–1.19, $\bar{x}$ = 0.86 ± 0.14, n = 36); vertebral crest more developed in adult males; 15–18 lamellae on Finger IV; 22–28 lamellae on Toe IV; tail length 63–70% of total length; posthumeral pocket Type 1 or 2. Sexual and geographic variation in measurements and scutellation of *S. iridescens* in Tables 8 and 9 respectively.

Table 8. Sexual variation in scutellation and measurements of *Stenocercus iridescens*. Range (first line), $\bar{x}$ ± SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	38–52	35–49
	42.13 ± 3.36	41.71 ± 3.48
	16	17
Vertebral scales	40–52	41–51
	44.50 ± 3.22	45.88 ± 2.96
	16	17
Paravertebral scales	44–52	44–57
	48.56 ± 2.19	50.18 ± 3.86
	16	17
Gular scales	16–20	17–20
	17.94 ± 1.24	18.41 ± 0.87
	16	17
Supraocular scales	2–4	3–5
	3.31 ± 0.70	3.41 ± 0.62
	16	17
Internasal scales	2–4	2–3
	2.69 ± 0.70	2.24 ± 0.44
	16	17
Subdigital lamellae on Finger IV	15–17	15–17
	15.63 ± 0.62	15.88 ± 0.89
	16	16
Subdigital lamellae on Toe IV	23–27	22–27
	24.69 ± 1.54	24.50 ± 1.55
	16	16
Head length/head width	1.19–1.3	1.09–1.30
	1.23 ± 0.04	1.23 ± 0.07
	16	17
Head height/head width	0.79–0.97	0.72–1.04
	0.88 ± 0.05	0.89 ± 0.08
	16	17
Body height/body width	0.66–1.12	0.70–1.19
	0.84 ± 0.12	0.90 ± 0.13
	16	14
Regenerated tail length/tail length	3.38	—
	—	—
	1	—
Tail length/total length	0.21–0.70	0.65–0.70
	0.63 ± 0.14	0.68 ± 0.01
	11	15
Maximum size (mm)	213	294

Color in life: Dorsum (Fig. 5E) of adult male (KU 142684) brown with dark brown chevrons, especially on the neck where they are black; side of neck pale greenish gray and black; pale greenish-yellow spots on thighs; chin yellow anteriorly, pink or gray posteriorly; gular region black; throat and ventral surfaces of forelimbs bright yellow; belly and ventral surface of proximal half of tail lavender-pink; ventral surfaces of hind limbs bronze-gray; iris copper; tongue white (William E. Duellman, field notes, 4 July 1971). Dorsum of adult female (QCAZ 3322) brown; white line extending longitudinally from tympanum to midbody; another white line extending vertically from the former to shoulder, this line bordered anteriorly with black; sides of head (including supralabials and infralabials) white with

Table 9. Geographic variation in scutellation and measurements of *Stenocercus iridescens*. Range (first line), $\bar{x} \pm$ SD (second line), and *n* (third line) are given.

Character	Balzar, Guayas	Cerro Blanco, Guayas	Tonsupa, Esmeraldas	Cabo Pasado, Manabí	Río Palenque, Los Ríos
Scales around midbody	35–41	40–43	43–45	39–44	39–45
	38.86 ± 1.86	41.25 ± 1.50	44.00 ± 0.82	42.00 ± 2.16	42.50 ± 2.65
	7	4	4	4	4
Vertebral scales	40–51	42–50	43–47	43–49	40–45
	45.14 ± 3.53	46.50 ± 3.32	45.25 ± 1.71	45.75 ± 2.75	42.25 ± 2.22
	7	4	4	4	4
Paravertebral scales	47–55	48–56	47–53	46–51	44–48
	50.14 ± 2.79	52.25 ± 3.86	49.75 ± 2.50	48.75 ± 2.06	45.00 ± 2.00
	7	4	4	4	4
Gular scales	18	18–20	19–20	16–18	17–18
	—	19.00 ± 0.82	19.25 ± 0.50	17.00 ± 0.82	17.75 ± 0.50
	7	4	4	4	4
Supraocular scales	3–4	3–4	3	2–4	3–4
	3.71 ± 0.49	3.75 ± 0.50	—	3.00 ± 0.82	3.25 ± 0.50
	7	4	4	4	4
Internasal scales	2–3	2–3	2–3	2–4	2
	2.29 ± 0.49	2.25 ± 0.50	2.50 ± 0.58	3.00 ± 0.82	—
	7	4	4	4	4
Subdigital lamellae on Finger IV	15–16	15–17	15–16	15–16	15–17
	15.43 ± 0.53	16.25 ± 0.96	15.25 ± 0.50	15.75 ± 0.50	16.00 ± 1.15
	7	4	4	4	4
Subdigital lamellae on Toe IV	22–26	24–27	24–26	23–27	22–25
	23.86 ± 1.35	25.50 ± 1.29	25.25 ± 0.96	25.00 ± 1.63	23.5 ± 1.29
	7	4	4	4	4
Head length/head width	1.09–1.28	1.22–1.26	1.24–1.31	1.20–1.30	1.13–1.29
	1.20 ± 0.06	1.24 ± 0.02	1.28 ± 0.04	1.23 ± 0.05	1.22 ± 0.07
	7	4	4	4	4
Head height/head width	0.79–0.93	0.84–0.96	0.88–1.04	0.87–0.97	0.82–0.98
	0.86 ± 0.05	0.88 ± 0.06	0.96 ± 0.08	0.91 ± 0.05	0.89 ± 0.08
	7	4	4	4	4
Body height/body width	0.75–0.96	0.69–0.87	0.72–1.12	0.66–0.77	0.80–0.95
	0.85 ± 0.08	0.79 ± 0.08	0.98 ± 0.22	0.73 ± 0.05	0.90 ± 0.07
	6	4	3	4	4
Tail length/total length	0.67–0.70	0.67–0.69	0.67–0.68	0.21–0.70	0.68–0.69
	0.68 ± 0.01	0.68 ± 0.01	0.67 ± 0.01	0.56 ± 0.23	0.68 ± 0.01
	7	3	2	4	3
Maximum size (mm)	246	246	292	203	294

small brown dots; dark brown oblique stripe extending posteroventrally from lower border of eye to infralabials; dark brown interorbital bar present; one short horizontal white stripe on the posterior surface of each thigh; gular region and ventral surfaces of limbs and body whitish cream; belly iridescent rose.

Color in preservative: Dorsum of males pale green or greenish-brown with a series of V-shaped dark brown marks on vertebral line with apex pointing posteriorly; V-shaped marks extending on proximal portion of tail in some individuals; flanks bluish gray; dorsum of head dark green with several small black dots; sides of head bluish gray, yellowish brown, or pale brown; pale brown stripe extending downward from eye to angle of mouth; gular region pale blue or pale gold; black band on throat; pink ventral surface of body, sometimes pale blue laterally; ventral surface of limbs yellow; dorsal surface of tail brown or yellowish brown; ventral surface of tail yellow proximally and brown distally. Dorsum and flanks of females dark brown or greenish brown; V-shaped marks over vertebral line; white line extending from shoulder to level of eye in some specimens; sides of head white or pale brown with small dark brown dots; pale brown stripe extending downward from eye to angle of mouth; gular region white or cream with several short longitudinal dark brown lines; ventral surface of body cream, greenish cream or dark yellowish brown; ventral surface of limbs pale yellow; tail yellowish brown.

Distribution and ecology.—In western Ecuador, *Stenocercus iridescens* occurs at elevations of 0–2000 m in the provinces of Azuay, Cotopaxi, El Oro, Esmeraldas, Guayas, Los Ríos, and Manabí (Fig. 16). The distribution lies mainly within the Tropical Desertic Thicket, Very Dry Tropical Forest, Dry Tropical Forest, Premontane Humid

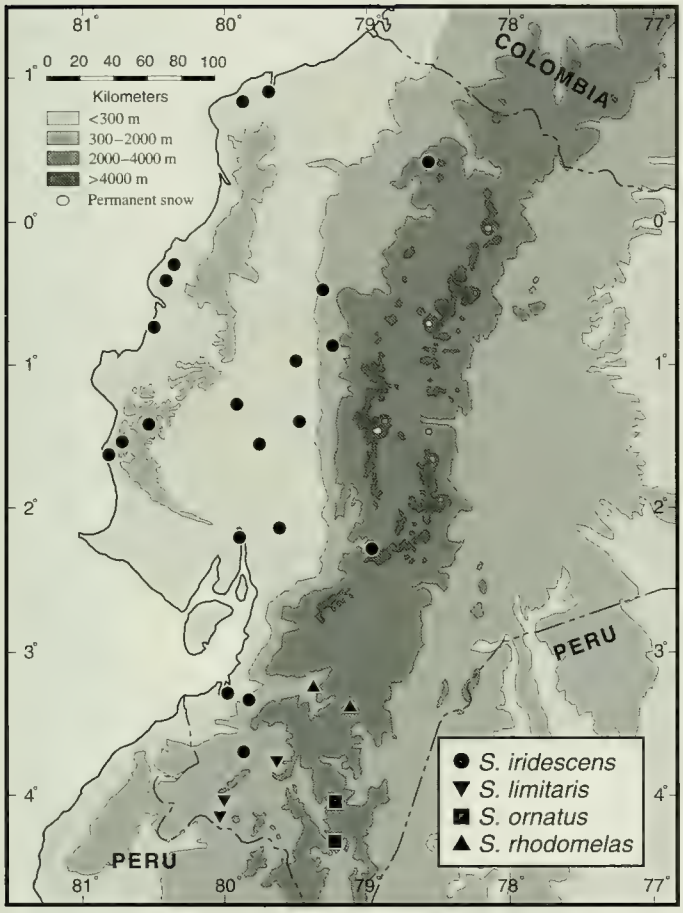


Fig. 16. Distribution of four species of *Stenocercus* in Ecuador.

Forest, and Very Humid Premontane Forest life zones. The mean annual temperature is 24–26°C in the former two life zones, 24–25°C in the third and 18–24°C in the latter two. The mean annual precipitation is 125–250 mm in the first one, 500–1000 mm in the second one, 1000–2000 mm in the third and fourth ones, and 2000–4000 mm in the latter one. This species also occurs in northwestern Peru (Cadle, 1991).

Stenocercus limitaris Cadle

Stenocercus limitaris Cadle, 1998:261. Holotype: AMNH 22183 a male from Alamor, 04°02' S, 80°02' W, 1325 m, Provincia Loja, Ecuador.

Diagnosis.—(1) Maximum SVL in males 97 mm (Cadle, 1998); (2) maximum SVL in females 82 mm (Cadle, 1998); (3) vertebral scales 40–52; (4) scales around midbody 39–54; (5) internasal scales 4–5; (6) gular scales 17–23; (7) lamellae on Finger IV 17–23; (8) lamellae on Toe IV 24–32; (9) posthumeral pocket Type 3 or 4; (10) postfemoral pocket Type 4 or 5; (11) projecting angulate temporals absent; (12) one row of enlarged supraoculars more than twice size of scales in adjacent rows; (13) occipital scales large, keeled or wrinkled, juxtaposed; (14) ventral scales mucronate, keeled, imbricate; (15) scales on posterior surfaces of thighs mucronate, keeled, imbricate; (16) antehumeral fold nearly inconspicuous; (17) tail strongly compressed laterally; (18) gular region in males not black; (19) dorsum brown in males and females.

Stenocercus limitaris is distinguished from other species of *Stenocercus* by the combination of keeled ventrals, keeled, wrinkled, or multicarinate large occipital scales, one row of enlarged supraoculars more than twice the size of scales in adjacent rows, two canthal scales, posthumeral pocket Type 3 or 4, postfemoral pocket Type 4 or 5, usually more than 40 scales around midbody, absence of dorsolateral crest, and absence of projecting angulate temporals.

Description and variation.—Cadle's (1998) description is sufficient. Measurements and scutellation of *S. limitaris* (from Cadle,1998) are summarized in Table 1.

Distribution and ecology.—*Stenocercus limitaris* occurs at elevations of 1000–1300 m in southwestern Ecuador. It inhabits the upper valley of the Río Chira (Pacific Drainage) in Provincia El Oro and Provincia Loja (Fig. 16). The distribution lies within the Humid Premontane Forest, where the mean annual precipitation is 1000–2000 mm and the mean annual temperature is 18–24°C. *Stenocercus limitaris* is sympatric with *S. carrioni* and *S. iridescens*. This species occurs also in northwestern Peru (Cadle, 1998).

Stenocercus ornatus (Gray)

Leiocephalus ornatus Gray, 1845:219. Holotype: BM 1946.8.29.72 from "Guayaquil [Provincia Guayas, Ecuador]" (restricted to Loja, 2150 m, Provincia Loja, Ecuador, by Fritts [1974]).

Leiocephalus ornatus ornatus (Part)—Burt and Burt, 1931:271.

Ophryoessoides ornatus—Etheridge, 1966:88.

Stenocercus ornatus—Fritts, 1974:62.

Diagnosis.—(1) Maximum total length in males 294 mm ($n = 15$); (2) maximum total length in females 207 mm ($n = 11$); (3) vertebral scales 36–50; (4) scales around midbody 46–58; (5) internasal scales 2–4; (6) gular scales 15–23; (7) lamellae on Finger IV 17–25; (8) lamellae on Toe IV 26–37; (9) posthumeral pocket Type 4; (10) postfemoral pocket Type 5; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, keeled or wrinkled, juxtaposed; (14) ventral scales smooth or slightly keeled, imbricate; (15) scales on posterior surfaces of thighs keeled, imbricate; (16) antehumeral fold nearly inconspicuous; (17) tail slightly or moderately compressed laterally; (18) gular region of males not black; (19) dorsum brown.

Stenocercus ornatus is distinguished from other species of *Stenocercus* by the combination of smooth ventrals (slightly keeled in 43% of the specimens), imbricate scales on posterior surface of thigh, no enlarged supraoculars, slightly imbricate occipitals, posthumeral pocket Type 4,

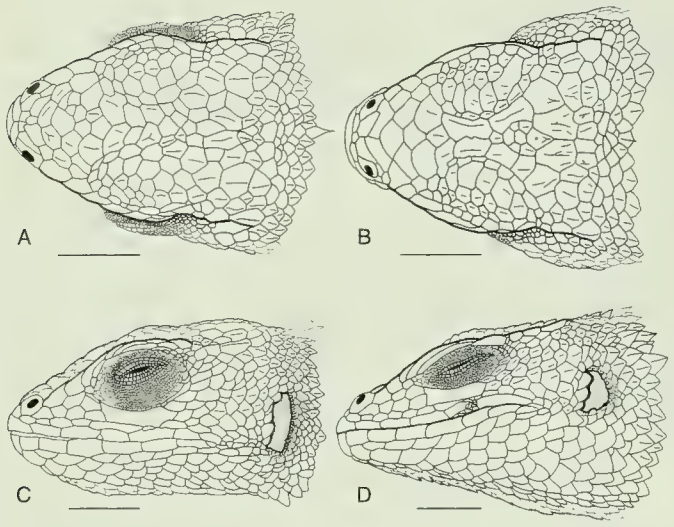


Fig. 17. Dorsal and lateral views of the heads of two species of *Stenocercus*. A and C *S. ornatus*, FHGO 679, male. B and D *S. rhodomelas*, QCAZ 3663, male. Scale bars = 5 mm.

postfemoral pocket Type 5, 46–58 scales around midbody, 17–25 lamellae on Finger IV, 26–37 lamellae on Toe IV, no black gular patch in males, vertical black bar on antehumeral fold in males, and antehumeral, supra-auricular, and dorsolateral folds.

Description and variation.—Measurements and scutellation of *Stenocercus ornatus* in Table 1. Head (Fig. 17A and C) wider than high (HH/HW = 0.71–0.98, $\bar{x}$ = 0.85 ± 0.05, n = 40); occipitals, parietals, interparietal, and postparietals small, keeled, slightly imbricate; 2–4 postrostrals (wider than long when there are 2 or 3 but as wide as long when there are 4); 2–4 internasals, usually 4 (64% of specimens); 2 canthals, most anterior one in contact with nasal or separated from it by 2 tiny scales; supraoculars keeled; enlarged supraoculars absent; lateral temporals slightly keeled, imbricate; parietal eye visible in 82% of specimens; gulars imbricate and smooth, each bearing apical pit; mental in contact with first pair of infralabials and first pair of postmentals; postmentals in contact medially or sometimes separated by tiny scale (14% of specimens).

Body normally wider than high (BH/BW = 0.62–1.36, $\bar{x}$ = 0.82 ± 0.16, n = 34); dorsal scales of neck and body and lateral scales of body keeled, imbricate, mucronate; lateral scales of neck keeled, imbricate; vertebrals large, forming prominent, serrate vertebral crest; slight dorsolateral crest on each side of neck (extending behind shoulder in some specimens); ventrals imbricate, smooth, or slightly keeled (43% of the specimens); preauricular fringe nearly inconspicuous; antehumeral, supra-auricular, and dorsolateral folds weakly developed, most evident in adult males; ventral scales of forelimbs, dorsal scales of forelimbs and hind limbs, palmars and plantars imbricate, keeled (mucronate in some specimens); ventral scales of hind limbs smooth, imbricate; scales on posterior surface of thighs keeled, imbricate; dorsal scales of hands and feet imbricate, keeled, or smooth (some with apical pit); 17–25 lamellae on Finger IV; 26–37 lamellae on Toe IV; tail slightly compressed in females, moderately compressed in males; caudals keeled, imbricate, mucronate (anterior ventrals not mucronate); vertebral crest extending more than half length of tail; tail length 60–72% of total length; posthumeral pocket Type 4; postfemoral pocket Type 5. Sexual variation in scutellation and measurements of *Stenocercus ornatus* in Table 10.

Table 10. Sexual variation in scutellation and measurements of *Stenocercus ornatus*. Range (first line), $\bar{x}$ ± SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	47–56	46–58
	51.95 ± 2.26	51.95 ± 3.19
	20	20
Vertebral scales	39–50	36–50
	45.35 ± 3.01	42.63 ± 3.47
	20	19
Paravertebral scales	53–65	54–66
	60.30 ± 3.37	59.68 ± 3.8
	20	19
Gular scales	15–20	16–23
	18.1 ± 1.33	18.8 ± 1.54
	20	20
Supraocular scales	4–6	5–7
	5.25 ± 0.55	5.6 ± 0.60
	20	20
Internasal scales	2–4	2–4
	3.55 ± 0.76	3.77 ± 0.57
	20	20
Subdigital lamellae on Finger IV	17–24	17–25
	20.65 ± 1.95	21.8 ± 1.88
	20	20
Subdigital lamellae on Toe IV	26–34	27–37
	29.2 ± 1.85	30.85 ± 2.41
	20	20
Head length/head width	1.16–1.37	1.06–1.34
	1.29 ± 0.06	1.26 ± 0.06
	20	20
Head height/head width	0.71–0.93	0.78–0.98
	0.83 ± 0.05	0.87 ± 0.05
	20	20
Body height/body width	0.62–1.05	0.69–1.36
	0.74 ± 0.10	0.89 ± 0.17
	16	18
Regenerated tail length/tail length	0.01–2.76	0.95–2.13
	1.44 ± 1.20	1.36 ± 0.55
	6	4
Tail length/total length	0.66–0.69	0.6–0.72
	0.68 ± 0.01	0.69 ± 0.03
	11	15
Maximum size (mm)	207	294

Color in life: Dorsum of males (Fig. 5F) pale brown or gray brown; narrow or wide black transverse blotches on

dorsum between indistinct beige dorsolateral stripes; flanks suffused with pink or reddish cream; conspicuous broad black bar on antehumeral fold; chin and gular region pale red or pinkish red (with black suffusion in some specimens); yellow patch on pectoral region; broad black stripe on each side of midventral line between pectoral and pelvic regions; rest of ventral surface of body pink or reddish cream; anal region, ventral surface of thighs, and base of tail yellow (heavily suffused with black in some specimens); lateral and ventral surface of tail pink (Thomas H. Fritts, field notes, 21 June 1970). Dorsum of an adult female (QCAZ 3790) brown with black marks; pale brown irregular bands in flanks; white scale below each eye; chin and labials yellow; venter pink with gray dotted pattern medially; distal half of tail greenish brown; iris pale brown (John J. Wiens, field notes, 27 April 1990).

Color in preservative: Dorsum of males dark brown, olive-green, or bluish gray; 6–8 dark brown, short transverse bars on vertebral line from neck to base of tail; 4–5 black transverse lines on dorsal surface of limbs; large black mark anterior to each shoulder; gular region bluish gray, dark brown, pale blue, or pale red; pectoral region black (with several pale blue, cream, or gray scales in some specimens); black midventral stripe; rest of belly pink, gray, or dark brown; ventral surface of limbs pale blue, brown, or gray; dark transverse rings intercalated with pale rings on tail; black mark on the anterior ventral region of the tail in 18% of specimens. Dorsal color of females same as in males, but transverse dark bars narrower; pale dorsolateral line extending from behind eye to hind limbs in 60% of specimens; black mark in front of shoulder absent; loreal region cream; dark brown or black stripe from angle of mouth, through tympanum, to, or behind shoulder; supralabials and infralabials dark brown or black; ventral surfaces bluish gray, cream, reddish cream, or yellowish green, with small irregular dark marks in some specimens; scattered dark brown flecks in gular region; tail with ringed pattern as in males.

Natural history.—One female (EPN 5879) contained two oviductal eggs. The sizes of these eggs are 17.01 mm × 9.47 mm and 18.07 mm × 9.32 mm; their volumes are 798.7 mm^3 and 821.8 mm^3, respectively.

Distribution and ecology.—*Stenocercus ornatus* occurs at elevations of 1500–3000 m in the Loja Basin in southern Ecuador. It inhabits the upper valleys of the Río Catamayo (Pacific Drainage) and Río Zamora (Atlantic Drainage) in Provincia Loja (Fig. 16). The distribution lies within the Dry Low Montane Forest and Humid Premontane Forest. The mean annual temperature in these zones is 12–18°C and 18–24°C, respectively. The mean annual precipitation is 500–1000 mm in the former and 1000–2000 mm in the latter.

Stenocercus ornatus and *S. humeralis* occur in sympatry in the upper valley of the Río Zamora. According to Fritts (1974), *S. humeralis* is abundant on small shrubs and trunks of eucalyptus trees in mesic valleys, as well as on agave plants and on top of fences, whereas *S. ornatus* is confined to more open habitats at bases of shrubs and in low rows of agave.

Stenocercus rhodomelas (Boulenger)

Liocephalus rhodomelas Boulenger, 1899:455. Syntypes: BM 1946.8.29.77–80, from "Oña [Provincia Azuay], Ecuador."
Ophryoessoides rhodomelas—Etheridge, 1966:88.
Stenocercus rhodomelas—Fritts, 1974:63.

Diagnosis.—(1) Maximum total length in males 235 mm (n = 10); (2) maximum total length in females 236 mm (n = 13); (3) vertebral scales 43–54; (4) scales around midbody 43–55; (5) internasal scales 2–4; (6) gular scales 17–20; (7) lamellae on Finger IV 14–21; (8) lamellae on Toe IV 22–29; (9) posthumeral pocket Type 4; (10) postfemoral pocket Type 5; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, keeled or wrinkled, juxtaposed; (14) ventral scales smooth, imbricate; (15) scales on posterior surfaces of thighs keeled, imbricate, mucronate; (16) antehumeral fold absent; (17) tail not laterally compressed; (18) gular region of males black; (19) dorsal ground color of males brown.

Stenocercus rhodomelas differs from other species of *Stenocercus* by the combination of smooth ventrals, imbricate scales on posterior surface of thigh, no enlarged supraoculars, posthumeral pocket Type 4, postfemoral pocket Type 5, 43–55 scales around midbody, 17–20 gular scales, black gular patch in males, black ventral surface of hindlimbs in males, and no neck folds.

Description of syntype BM 1946.8.29.77.—Head wider than high (HH/HW = 0.86); occipitals, parietals, interparietal and postparietals small, keeled or wrinkled, juxtaposed; 2 postrostrals, wider than long; 2 internasals; 2 canthals, most anterior one in contact with nasal; supraoculars keeled or wrinkled, juxtaposed; enlarged supraoculars absent; lateral temporals keeled, imbricate; parietal eye visible; gulars large, smooth, imbricate, each with an apical pit; mental in contact with first pair of infralabials and first pair of postmentals.

Dorsal and lateral scales of neck and body keeled, imbricate, mucronate; vertebrals large, forming prominent vertebral crest; ventrals smooth, imbricate, each with an apical pit; preauricular fringe well developed; neck folds absent; forelimb scales keeled, imbricate, mucronate (some dorsal scales of hand smooth, imbricate); dorsal scales of hind limb keeled, imbricate, mucronate; ventral scales of hind limbs smooth or weakly keeled and imbricate; palmar and plantar scales keeled, imbricate; 18 lamellae on Finger IV; 29 lamellae on Toe IV; tail slightly compressed;

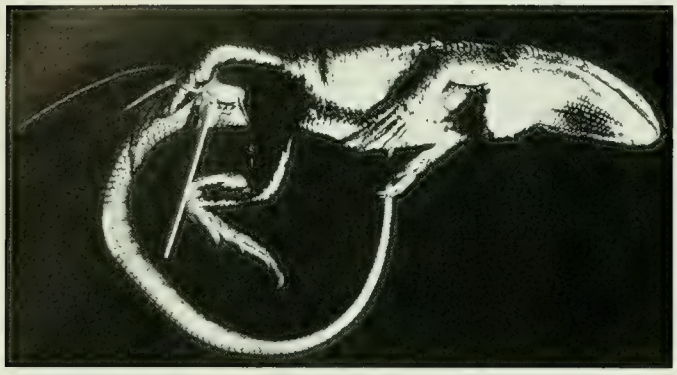


Fig. 18. *Stenocercus rhodomelas*, syntype, BM 1946.8.29.77, male.

caudals keeled, imbricate, mucronate (anterior ventrals smooth, imbricate); vertebral crest extending more than half the length of the tail; tail length 64% of total length; posthumeral pocket Type 4; postfemoral pocket Type 5.

Data on syntype BM 1946.8.29.77: Male (Fig. 18); SVL = 82 mm; TL = 146 mm; HW = 13.2 mm; HL = 17.8 mm; HH = 11.3 mm; SM = 50; VS = 51; PS = 56; SS = 5; IS = 2; GS = 19; SF = 18; ST = 29.

Variation.—Measurements and scutellation of *Stenocercus rhodomelas* in Table 1. Head (Fig. 17B and D) wider than high (HH/HW = 0.69–0.99, $\bar{x} = 0.83 \pm 0.07$, $n = 29$); 2–3 postrostrals, wider than long; if 3 postrostrals, middle one as wide as long; 2–4 internasals, usually 2 (67% of specimens); most anterior canthals separated from nasals by 2 tiny scales (29% of specimens); parietal eye visible in 67% of specimens; apical pits of gulars and ventrals most evident in adult males; body normally wider than high (BH/BW = 0.64–1.03, $\bar{x} = 0.81 \pm 0.10$, $n = 16$); vertebral crest most conspicuous in adult males; 14–21 lamellae on Finger IV; 22–29 lamellae on Toe IV; vertebral crest extending more than half length of tail in males, less than half length in females; tail length 57–66% of total length. Sexual variation in scutellation and measurements of *S. rhodomelas* is presented in Table 11.

Table 11. Sexual variation in scutellation and measurements of *Stenocercus rhodomelas*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	44–55	43–51
	49.21 ± 2.84	48.23 ± 2.52
	19	13
Vertebral scales	43–54	43–52
	47.63 ± 3.44	47.77 ± 3.06
	19	13
Paravertebral scales	49–60	52–61
	54.79 ± 3.21	55.54 ± 2.63
	19	13
Gular scales	17–20	17–20
	18.26 ± 0.93	18.38 ± 0.96
	19	13
Supraocular scales	3–6	5–6
	5.00 ± 0.67	5.54 ± 0.52
	19	13
Internasal scales	2–3	2–4
	2.26 ± 0.45	2.77 ± 0.73
	19	13
Subdigital lamellae on Finger IV	14–18	15–21
	16.21 ± 1.27	17.69 ± 1.49
	19	13
Subdigital lamellae on Toe IV	22–27	23–29
	25.11 ± 1.33	26.54 ± 1.66
	19	13
Head length/head width	1.19–1.36	0.98–1.50
	1.27 ± 0.05	1.23 ± 0.13
	18	12
Head height/head width	0.72–0.90	0.69–0.99
	0.81 ± 0.06	0.85 ± 0.08
	17	12
Body height/body width	0.64–0.89	0.65–1.03
	0.77 ± 0.08	0.83 ± 0.12
	13	9
Regenerated tail length/tail length	0.32–0.77	1.10–3.82
	0.52 ± 0.21	2.46 ± 1.93
	4	2
Tail length/total length	0.61–0.66	0.57–0.64
	0.64 ± 0.01	0.62 ± 0.02
	13	10
Maximum size (mm)	236	235

Color in life: Dorsum and flanks of an adult male (QCAZ 3663) dark brown with several pink, cream, or black scales distributed irregularly; vertebral crest dark brown with a few yellow scales, some with black marks; dorsal black V-shaped mark between shoulders with vertex posteriorly; three faint V-shaped marks behind the latter; small black mark anterior to each shoulder; dorsal surface of head darker than body; infralabials, supralabials, and rostral black; sublabials, lorilabials, suboculars, and first pair of postmentals yellow; gular region black except for pale yellow dot on chin; throat pink with thin black midventral stripe continuous with black gular patch; anterior part of pectoral region greenish blue; posterior part of pectoral region, midventral line, pelvic region, and ventral surfaces of thighs and shanks black, rest of ventral surface of body cream; small black triangular mark behind vent pointing backwards; ventral surface of tail pink proximally, cream distally (Omar Torres-Carvajal, field notes, 11 January 1997).

Color in preservative: Dorsum of males dark greenish brown or pale brown with irregular black dots; 6–7 dark transverse stripes on dorsal surface of body, dark brown stripe at the level of shoulders extends to point anterior to the insertion of forelimbs; short dark stripe parallel to latter at insertion of forelimbs; gular region black; throat slightly pink; anterior part of pectoral region pale blue or whitish cream; posterior part of pectoral region, midventral line, pelvic region, and ventral surfaces of thighs and shanks black; small black irregular or triangular mark

pointing posteriorly behind vent in 60% of specimens; ventral surface of tail pink or cream proximally and cream distally. Dorsum of females dark brown; gular region cream with dark brown flecks; ventral surface cream.

Distribution and ecology.—*Stenocercus rhodomelas* is known from the western slopes of the Cordillera Occidental and Saraguro Basin in southern Ecuador (Provincia Azuay and Provincia Loja). It occupies the upper valley of the Río Jubones (Pacific Drainage) at elevations of 730–2100 m (Fig. 16). The distribution lies mainly within the Low Humid Montane Forest and Thorny Premontane Thicket life zones. The mean annual temperature is 12–18°C and 18–24°C, respectively. The mean annual precipitation is 1000–2000 mm and 250–500 mm.

The area occupied by this species is xeric with sparse vegetation of cactus and agave plants; individuals can be found on large rocks and on the ground at the bases of cactus (Fritts, 1974). Although Fritts (1974) mentioned that *Stenocercus simonsii* and *S. rhodomelas* are allopatric at elevations above 2200 m in the upper valley of the Río Jubones, both species occur in sympatry (Oña, 1981 m, Provincia Azuay). Also, *S. rhodomelas* possibly is sympatric with *S. festae* in the Saraguro Basin.

Stenocercus simonsii Boulenger

Stenocercus simonsii Boulenger, 1899:454. Syntypes: BM 1946.8.11.73–74, from "Oña, 6500 ft (= 1981.2 m), [Provincia Azuay] Ecuador."

Diagnosis.—(1) Maximum SVL in males 88 mm (Cadle, 1991); (2) maximum SVL in females 79 mm (Cadle, 1991); (3) vertebral scales 59–98; (4) scales around midbody 79–102; (5) internasal scales 4; (6) gular scales 36–57; (7) lamellae on Finger IV 24–28; (8) lamellae on Toe IV 28–37; (9) posthumeral pocket Type 1; (10) postfemoral pocket Type 3; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, smooth, juxtaposed; (14) ventral scales smooth, imbricate; (15) scales on posterior surfaces of thighs granular; (16) antehumeral fold well developed; (17) tail laterally compressed distally; (18) gular region of males not black; (19) dorsum greenish gray or pale gray.

Stenocercus simonsii is distinguished from other species of *Stenocercus* by the combination of smooth ventrals, granular scales on posterior surface of thigh, dorsal surface of neck, and anterolateral surface of trunk, complete vertebral row, 2 caudal whorls per autotomic segment, caudal whorls subequal in size, posthumeral pocket Type 1, postfemoral pocket Type 3, 79–102 scales around midbody, 36–57gular scales, 94–118 paravertebral scales, 24–28 lamellae on Finger IV, and 6 or more scale rows within antegular fold.

Description and variation.—Cadle's (1991) description is sufficient. Measurements and scutellation of *S. simonsii* (from Cadle, 1991) are summarized in Table 1.

Color in life: Males with broad black collar posterior to antehumeral fold, incomplete at vertebral line; small black and yellow spots on flanks; white stripe from infraorbital scales to shoulder in some specimens; hind limbs dull black with pinkish-beige transverse stripes; limbs and tail with alternate black and white bars in some specimens; chin and gular region pale yellowish green; gular fold black interiorly; ventral surface of forelimbs, body, and base of tail orange-yellow (Thomas H. Fritts, field notes, 6 June 1970). Dorsum of females (Fig. 5G) greenish brown; chin and gular region usually with scattered brown or black spots; venter pale yellowish beige (Thomas H. Fritts, field notes, 6 June 1970). Fritts (1974) mentioned that individuals from Girón (Provincia Azuay) differ in dorsal coloration from those from Saraguro (Provincia Loja). Lizards from the former locality have a pale gray-green dorsum with distinct black transverse blotches, whereas lizards from Saraguro have a pale gray dorsum with smaller, less distinct blotches.

Distribution and ecology.—*Stenocercus simonsii* occurs at elevations of 1980–2500 m in southern Ecuador (Provincia Azuay and Provincia Loja). It inhabits the upper valley of the Río Jubones (Pacific Drainage) on the western slopes of the Cordillera Occidental and Saraguro Basin (Fig. 19). The distribution lies within the Low Dry Montane Forest with a mean annual temperature of 12–18°C and a mean annual precipitation of 500–1000 mm.

Stenocercus simonsii and *S. festae* occur in sympatry in the upper valley of the Río Jubones; in this area *S. simonsii* usually is found on large rocks or rock piles, whereas *S. festae* utilizes the leaves of agave plants and the surrounding ground (Fritts, 1974). Although Fritts (1974) mentioned that *Stenocercus simonsii* and *S. rhodomelas* are allopatric at elevations above 2200 m in the upper valley of the Río Jubones, both species occur in sympatry (Oña, 1981 m, Provincia Azuay).

Stenocercus varius Boulenger

Stenocercus varius Boulenger, 1885:134. Holotype: BM 71.4.16.53, "unknown locality" (restricted to Tandapi, 1460 m, Provincia Pichincha, Ecuador, by Fritts [1974]).

Diagnosis.—(1) Maximum total length in males 234 mm (n = 9); (2) maximum total length in females 208 mm (n = 14); (3) vertebral scales 60–74; (4) scales around midbody 74–88; (5) internasal scales 4–5; (6) gular scales 42–60; (7) lamellae on Finger IV 24–28; (8) lamellae on Toe IV 27–34; (9) posthumeral pocket Type 1; (10) postfemoral pocket Type 1 or 2; (11) projecting angulate temporals absent; (12) row of enlarged supraoculars absent; (13) occipital scales small, smooth, juxtaposed; (14) ventral scales smooth, imbricate; (15) scales on posterior surfaces of thighs granular; (16) antehumeral fold present; (17) tail

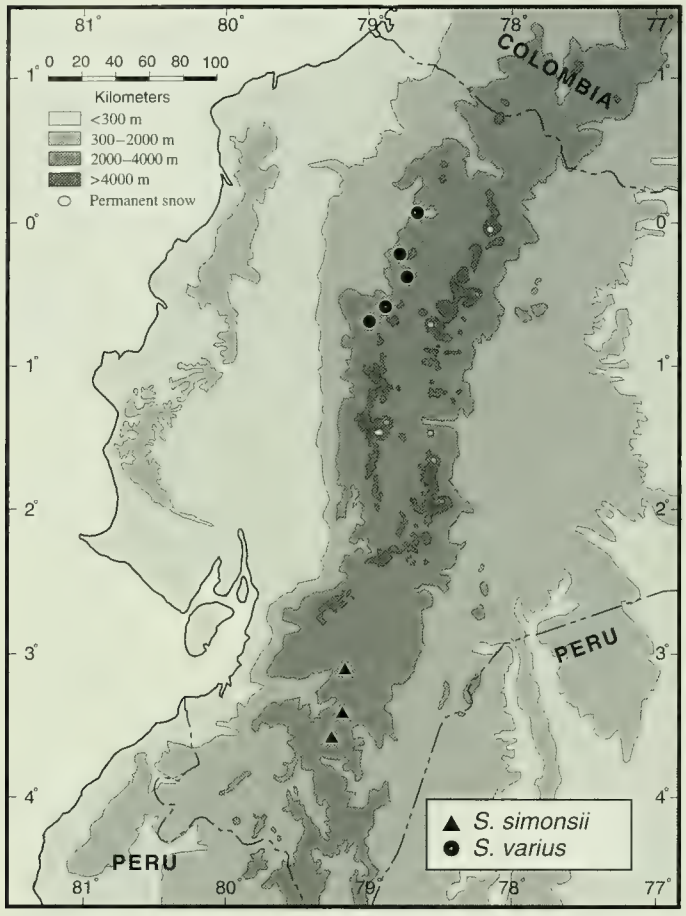


Fig. 19. Distribution of two species of *Stenocercus* in Ecuador.

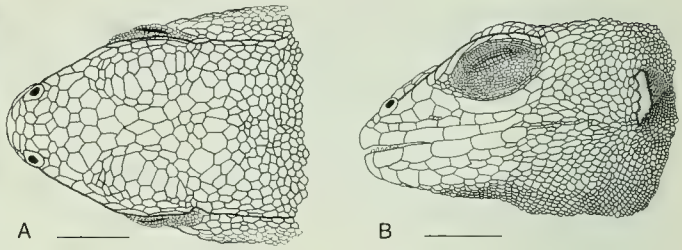


Fig. 20. Dorsal (A) and lateral (B) views of the head of *Stenocercus varius*, QCAZ 3046, female. Scale bar = 5 mm.

Table 12. Sexual variation in scutellation and measurements of *Stenocercus varius*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Females	Males
Scales around midbody	74–88	79–88
	81.36 ± 4.16	84.56 ± 3.94
	14	9
Vertebral scales	60–73	64–74
	66.93 ± 3.83	69.33 ± 2.87
	14	9
Paravertebral scales	76–97	83–97
	86.79 ± 5.67	88.78 ± 5.07
	14	9
Gular scales	42–58	47–60
	49.36 ± 4.18	53.00 ± 4.18
	14	9
Supraocular scales	5–6	5–7
	5.57 ± 0.51	5.56 ± 0.73
	14	9
Internasal scales	4–5	4
	4.07 ± 0.27	—
	14	9
Subdigital lamellae on Finger IV	24–28	24–28
	25.54 ± 1.13	25.5 ± 1.31
	13	8
Subdigital lamellae on Toe IV	27–32	29–34
	29.31 ± 1.32	30.38 ± 1.60
	13	8
Head length/head width	1.22–1.46	1.21–1.33
	1.32 ± 0.06	1.29 ± 0.04
	14	9
Head height/head width	0.73–0.89	0.76–1.04
	0.81 ± 0.05	0.87 ± 0.09
	14	9
Body height/body width	0.58–0.82	0.66–0.96
	0.72 ± 0.08	0.77 ± 0.09
	13	9
Regenerated tail length/tail length	0.01–2.87	0.48
	1.38 ± 1.58	—
	4	1
Tail length/total length	0.60–0.64	0.61–0.65
	0.62 ± 0.01	0.63 ± 0.01
	9	6
Maximum size (mm)	208	233

slightly compressed laterally; (18) gular region of males not black; (19) dorsum bluish gray or green.

Stenocercus varius differs from other species of *Stenocercus* by the combination of smooth ventrals, granular scales on posterior surface of thigh, distinct vertebral crest, 3 caudal whorls per autotomic segment, caudal scales without projecting spines, posthumeral pocket Type 1, postfemoral pocket Type 1 or 2, and 74–88 scales around midbody.

Description and variation.—Measurements and scutellation of *Stenocercus varius* in Table 1. Head (Fig. 20A and B) usually wider than high (HH/HW = 0.73–1.04, $\bar{x}$ = 0.83 ± 0.07, n = 25); occipitals, parietals, interparietal, and postparietals small, smooth, juxtaposed; 3 postrostrals, wider than long; 4–5 internasals, usually 4 (96%); 2 canthals, most anterior one in contact with nasal; supraoculars smooth, juxtaposed; enlarged supraoculars absent; lateral temporals smooth, juxtaposed; parietal eye not visible in 92% of specimens; gulars small, imbricate, smooth (most anterior gulars granular); mental in contact with first pair of infralabials and first pair of postmentals.

Table 13. Geographic variation in scutellation and measurements of *Stenocercus varius*. Range (first line), $\bar{x} \pm$ SD (second line) and n (third line) are given.

Character	Las Pampas, Cotopaxi	La Favorita, Pichincha	Río Guajalito, Pichincha	Tandapi, Pichincha
Scales around midbody	81–88	80–88	74–81	79–88
	86.14 ± 2.54	83.25 ± 3.40	77.00 ± 3.24	82.00 ± 3.52
	7	4	5	6
Vertebral scales	64–74	63–70	60–73	66–72
	68.29 ± 3.20	66.75 ± 3.77	66.80 ± 4.66	69.50 ± 2.07
	7	4	5	6
Paravertebral scales	87–97	76–86	77–91	83–97
	90.86 ± 3.63	82.00 ± 4.24	86.20 ± 5.89	87.50 ± 5.58
	7	4	5	6
Gular scales	42–60	46–53	44–56	47–49
	53.29 ± 5.71	50.25 ± 3.10	48.40 ± 4.83	48.50 ± 0.84
	7	4	5	6
Supraocular scales	5–6	5–6	5–6	5–7
	5.43 ± 0.53	5.50 ± 0.58	5.60 ± 0.55	5.83 ± 0.75
	7	4	5	6
Internasal scales	4	4	4	4–5
	—	—	—	4.17 ± 0.41
	7	4	5	6
Subdigital lamellae on Finger IV	24–28	24–27	25–26	24–28
	25.33 ± 1.51	25.5 ± 1.29	25.75 ± 0.50	25.50 ± 1.38
	6	4	4	6
Subdigital lamellae on Toe IV	27–30	30–32	28–34	29–31
	28.83 ± 1.17	30.67 ± 1.15	30.80 ± 2.39	29.50 ± 0.84
	6	3	5	6
Head length/head width	1.21–1.36	1.30–1.50	1.27–1.46	1.22–1.33
	1.30 ± 0.05	1.38 ± 0.09	1.37 ± 0.08	1.28 ± 0.05
	7	4	5	6
Head height/head width	0.81–1.04	0.79–0.90	0.75–0.85	0.73–0.94
	0.87 ± 0.08	0.83 ± 0.05	0.81 ± 0.04	0.83 ± 0.08
	7	4	5	6
Body height/body width	0.68–0.96	0.54–0.80	0.70–0.78	0.63–0.83
	0.77 ± 0.09	0.66 ± 0.12	0.73 ± 0.04	0.74 ± 0.08
	7	4	3	6
Regenerated tail length/tail length	—	0.03–2.87	0.01	2.63
	—	1.04 ± 1.26	—	—
	—	4	1	1
Tail length/total length	0.61–0.63	—	0.60–0.66	0.64
	0.62 ± 0.01	—	0.64 ± 0.03	—
	6	—	4	3
Maximum size (mm)	208	180	234	201

Body wider than high (BH/BW = 0.54–0.96, $\bar{x} = 0.73 \pm 0.09$, $n = 23$); lateral scales of body and dorsal scales of neck and body keeled, imbricate; lateral scales of neck granular; lateral scales of body near venter approximately half size of dorsals; vertebrals small, not forming conspicuous vertebral crest; ventrals smooth, imbricate, each with an apical pit; preauricular fringe nearly inconspicuous; antehumeral, gular, antegular, longitudinal neck, oblique neck, rictal, postauricular, supra-auricular, dorsolateral, and ventrolateral folds present; dorsal scales of forelimbs and hind limbs keeled, imbricate; ventral scales of forelimbs and hind limbs smooth, imbricate; palmars and plantars imbricate, smooth, keeled; 24–28 lamellae on Finger IV; 27–34 lamellae on Toe IV; tail slightly compressed laterally; dorsal and lateral caudals keeled, imbricate; caudals keeled and imbricate ventrally; tail length 60–66% of total length; posthumeral pocket Type 1; postfemoral pocket Type 1 or 2. Sexual and geographic variation in scutellation and measurements of *Stenocercus varius* is presented in Tables 12 and 13 respectively.

Color in life: Dorsum and flanks of an adult male (QCAZ 3845) olive-green with several pale yellowish-green spots; large rhomboidal black mark anterior to each shoulder; dorsal surface of hind limbs dark brown; dorsal surface of head with black and dark brown marks; eyelids, gular region, and throat yellow; ventral surfaces of body, limbs, and proximal portion of tail yellowish cream; ventral surface of distal por-

tion of tail dark brown; iris bronze. Females without rhomboidal mark anterior to each shoulder (Fig. 5H).

Color in preservative: Dorsum gray; 6–8 short black transverse bands on dorsal surface of body from neck to base of tail; pale reticulations on dorsal surface of body and limbs; small white, cream, or bluish-cream dots on flanks in 55% of specimens; black rhomboidal mark anterior to each shoulder in males; black marks on dorsal surface of head in 95% of specimens; gular region gray, usually with several small, light oval marks; ventral surfaces of body and limbs gray; usually a thin cream midventral line that is interrupted by dark brown rings on ventral surface of tail in some individuals.

Natural history.—One female (QCAZ 3046) collected on 15 October 1995 contained two oviductal eggs. The sizes of these eggs are 22.63 mm × 9.14 mm and 22.44 mm × 8.96 mm; their volumes are 989.9 mm^3 and 943.3 mm^3, respectively. The same female had a body temperature of 34.2°C when collected (A. Quiguango and Juan M. Guayasamin, field notes, 24 February 1998). The smallest juvenile (QCAZ 719), collected on 17 May 1988, has a total length of 134 mm (SVL = 45 mm, TL = 89 mm).

Distribution and ecology.—*Stenocercus varius* occurs at elevations of 1460–2200 m on the western slopes of the northern part of the Cordillera Occidental. It inhabits the upper valleys of the Río Blanco and Río Toachi (Pacific Drainage) in Provincia Cotopaxi and Provincia Pichincha (Fig. 19). The distribution lies within the Very Humid Premontane Forest and Low Very Humid Montane Forest. The mean annual temperature is 18–24°C and 12–18°C, respectively. The mean annual precipitation is 2000–4000 mm in both life zones. Individuals have been found on tree trunks, fallen logs, and rocks in partially cleared areas (Fritts, 1974). *Stenocercus varius* also occurs in patches of primary forest at the forest edges.

BIOGEOGRAPHY

GEOGRAPHICAL DISTRIBUTION

The distributional range of *Stenocercus* extends from the western lowlands (*S. iridescens*) through the Andean cordillera (e.g., *S. festae*) to the eastern lowlands (*S. aculeatus*). The species occur mostly on the western slopes of the Cordillera Occidental and in the inter-Andean basins. Ten species (*S. carrioni, chota, guentheri, haenschi, humeralis, iridescens, limitaris, rhodomelas, simonsii,* and *varius*) occur at elevations below 2200 m on the western versant of the Andes, whereas only two species (*S. carrioni* and *aculeatus*) occur at similar elevations on the eastern versant of the Andes (Fig. 21). Moreover, six species (*S. chota, festae, guentheri, humeralis, ornatus* and *rhodomelas*) occupy inter-Andean basins. This pattern contrasts with the trans-Andean distribution of other Ecuadorian herpetofaunal components such as *Anolis* with 21 western species versus six eastern species (Almendáriz, 1992), *Proctoporus* with nine western species versus seven eastern species (Kizirian, 1996), *Eleutherodactylus* with 61 western species (Lynch and Duellman, 1997) versus 74 eastern species (updated from Coloma, 1991) or *Colostethus* with 15 western species versus 16 eastern species (Coloma, 1995).

These lizards occur at elevations between sea level (*S. iridescens*) and 3890 m (*S. guentheri*). *Stenocercus iridescens* has the largest elevational range (0–2000 m), whereas *S. haenschi* is known from a single elevation (Fig. 22). Examination of altitudinal distributions by 100 m increments reveals that the greatest concentration of species (71%) is between 1500 m and 2500 m.

No species of *Stenocercus* is known to have a distributional range extending from Colombia to Peru. Three species occur in both Ecuador and Peru; *S. iridescens* and *S. limitaris* occur in western Ecuador and northwestern Peru (Cadle, 1991, 1998) and *S. aculeatus* inhabits the eastern slopes of the Ecuadorian and Peruvian Andes (Peters and Donoso-Barros, 1970). Only one Ecuadorian species, *S. guentheri*, also is known from Colombia (Ayala and Castro, 1982; Castro and Granados, 1993). Nevertheless, *S. angel* probably occurs in southern Colombia because its type locality lies close to the Colombian border.

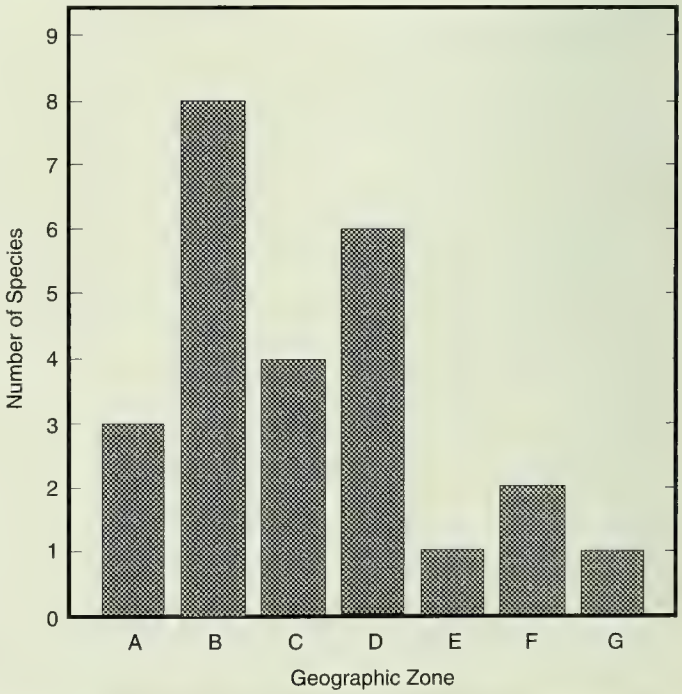


Fig. 21. Trans-Andean distribution of the genus *Stenocercus* in Ecuador.

ERRATA

SCIENTIFIC PAPERS, NATURAL HISTORY MUSEUM, UNIVERSITY OF KANSAS, NO. 15

Torres-Carvajal, O. 2000. Ecuadorian Lizards of the Genus *Stenocercus* (Squamata: Tropiduridae). Scientific Papers Natural History Museum, The University of Kansas 15:1-38.

Page 34.—Add the following to the legend for Fig. 21:

(A) Pacific lowlands < 1000 m, (B) western slopes of the Cordillera Occidental 1000–2200 m, (C) highlands of the Cordillera Occidental > 2200 m, (D) inter-Andean basins, (E) highlands of the Cordillera Oriental > 2200 m, (F) eastern slopes of the Cordillera Oriental 1000–2000 m, (G) eastern lowlands < 1000 m.

Page 36.—Add the following to first citation (Almendariz, A.):

207 pp.

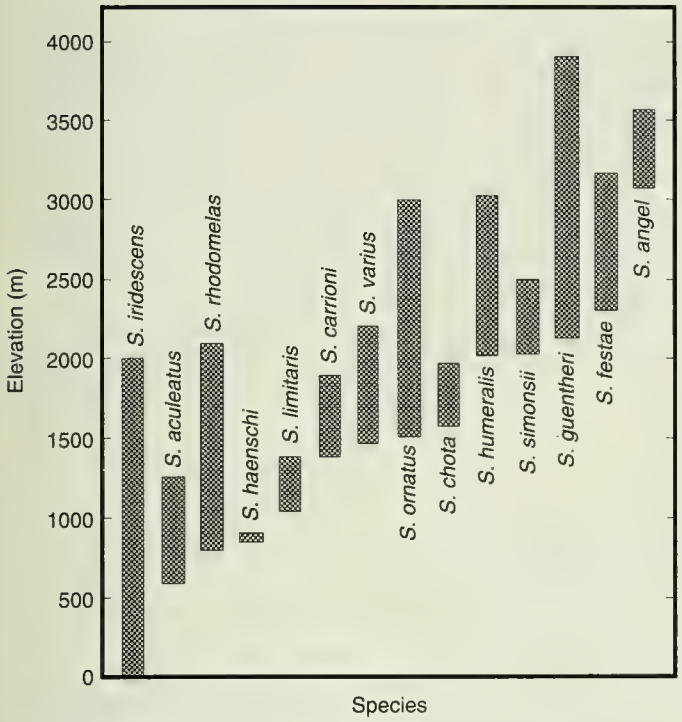


Fig. 22. Altitudinal distribution of species of *Stenocercus* in Ecuador.

Distribution patterns of *Stenocercus* in southern Ecuador and northern Peru are influenced by the Huancabamba Depression, a region widely recognized as a major biogeographic discontinuity for Andean organisms (Duellman, 1979). No species of *Stenocercus* is presently known from north and south of the depression (Cadle, 1991).

Ten species (71%) are endemic to Ecuador. Most of the Ecuadorian species occur south of 1°S Lat. *Stenocercus iridescens* has the greatest latitudinal distribution range (from 00°53' N to 05°55' S in northwestern Peru), whereas *S. haenschi* is known only from its type locality. Most of the Ecuadorian species of *Stenocercus* resemble the Andean lizard genera *Pholidobolus* (Montanucci, 1973) and *Proctoporus* (Kizirian, 1996) in having limited geographic distributions.

Table 14. Distribution of *Stenocercus* within life zones in Ecuador.

Life Zone	Number of Species
Thorny Premontane Thicket	1
Tropical Dry Forest	1
Tropical Very Dry Forest	1
Premontane Thorny Forest	2
Humid Premontane Forest	6
Very Humid Premontane Forest	3
Pluvial Premontane Forest	1
Low Thorny Montane Steppe	1
Montane Steppe	1
Low Dry Montane Forest	5
Low Humid Montane Forest	3
Low Very Humid Montane Forest	1
Humid Montane Forest	2
Very Humid Montane Forest	1
Sub-Andean Montane Forest	1

Nevertheless, additional collecting is necessary to obtain a clearer understanding of the distributional patterns of the species of *Stenocercus*.

ECOLOGICAL DISTRIBUTION

The ecological distribution of the Ecuadorian *Stenocercus* species is described in the species accounts. For analytical purposes, I used the classification of life zones of Ecuador proposed by Cañadas-Cruz (1983), which is based on the Holdridge (1947) system. The distribution of *Stenocercus* in Ecuador includes 15 life zones (Table 14). Most species inhabit premontane and montane forests. Dry life zones (annual mean precipitation < 1000 mm) are occupied by nine species, six of which (*S. angel, guentheri, humeralis, iridescens, ornatus*, and *rhodomelas*) also occur in humid life zones (annual mean precipitation > 1000 mm). Only three species (*S. chota, festae*, and *simonsii*) are restricted to dry life zones. In contrast, five species (*S. aculeatus, carrioni, haenschi, limitaris*, and *varius*) are restricted to humid life zones. Within its distribution, *Stenocercus iridescens* inhabits the driest life zone (Tropical Desertic Thicket), whereas *S. aculeatus* inhabits the most humid zone (Pluvial Premontane Forest).

KEY TO SPECIES OF *STENOCERCUS* OF ECUADOR

1. Scales on posterior surface of thigh imbricate 2
   Scales on posterior surface of thigh granular 10
2. One row of enlarged supraoculars, each more than twice size of scales in adjacent rows 3
   Row of enlarged supraoculars absent 5
3. Postfemoral pocket Type 4 or 5 ..... *S. limitaris*
   Postfemoral pocket of other types 4
4. Postfemoral pocket Type 3; projecting angulate temporals ..... *S. aculeatus*
   Postfemoral pocket Type 1; projecting angulate temporals absent ..... *S. iridescens*
5. Posthumeral pocket Type 4; postfemoral pocket Type 5 6
   Posthumeral and postfemoral pockets of other types 7
6. Antehumeral fold weak ..... *S. ornatus*
   Antehumeral fold absent ..... *S. rhodomelas*
7. Postfemoral pocket Type 3; gular region of males black; ventral scales of juveniles keeled ..... *S. festae*
   Postfemoral pocket Type 1 or 2; gular region of males

usually not black; ventral scales of juveniles and adults normally smooth 8

8. Females with large, black spots in gular region; males with dark midventral stripe and large blue ventrolateral marks ..... *S. chota*

   Females lacking black spots in gular region; males usually lacking blue marks on venter 9

9. Scales around middle of the body 59 or more ..... *S. guentheri*

   Scales around middle of the body fewer than 59 ..... *S. angel*

10. Scales around middle of the body fewer than 62 ..... *S. haenschi*

    Scales around middle of the body 62 or more 11

11. Caudal scales mucronate; two caudal whorls per autotomic segment 12

    Caudal scales not mucronate; three caudal whorls per autotomic segment 13

12. Vertebral row discontinuous; distal caudal whorls clearly alternating in size ..... *S. carrioni*

    Vertebral row continuous; caudal whorls equal in size ..... *S. simonsii*

13. Scales around middle of the body 98 or more ..... *S. humeralis*

    Scales around middle of the body fewer than 98 ..... *S. varius*

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APPENDIX

SPECIMENS EXAMINED

All specimens are from Ecuador unless noted otherwise. Species are arranged alphabetically. Localities are arranged alphabetically within provinces, which are also arranged alphabetically within each species.

Stenocercus aculeatus (12 specimens)

Provincia Pastaza: Mera, 1123 m, EPN 1153, 4050, 4051; 3 km S Puyo, 920 m, KU 127094; Río Solís, EPN 5902–5904; Veracruz, 950 m, KU 121092. *Provincia Tungurahua*: Río Negro, 01°24' S, 78°12' W, QCAZ 1635; no specific locality, ZMB 16594.

PERU: *Departamento San Martín*: Moyobamba, BM 1946.8.12.33–34 (syntypes).

Stenocercus angel (10 specimens)

Provincia Carchi: El Angel, 00°38' N, 77°56' W, 3015 m, QCAZ 1358 (paratype); 8 km NE El Angel on road El Angel-Tulcán, 00°40' N, 77°52' W, 3560 m, QCAZ 1354 (paratype), 3732 (paratype), 3733 (holotype), 4117–4119 (paratypes); 13.6 km W Tulcán on road Tulcán-Tufiño, 00°49' N, 77°49' W, 3040 m, QCAZ 3792 (paratype); Estación Biológica Guanderas, QCAZ 3777 (paratype). *Provincia Sucumbíos*: El Playón de San Francisco, 00°38' N, 77°38' W, 3300 m, QCAZ 1322 (paratype).

Stenocercus chota (55 specimens)

Provincia Carchi: La Concepción, 00°35' N, 78°07' W, 1575 m, MZUT R2154.1–5, R2154.25–29 (paratypes). *Provincia Esmeraldas*: Río Cachabí, EPN 5858–5860 (paratypes), 5862–5864 (paratypes). *Provincia Imbabura*: Ambuquí, 00°27' N, 78°01' W, 1780 m, QCAZ 799 (paratype); 6.5 km E Panamerican Highway on road Ambuquí-Monte Olivo, 1940 m, QCAZ 806 (paratype), 897–902 (paratypes), 3791 (paratype), 3794 (paratype); Chota, 00°28' N, 78°04' W, QCAZ 2654 (paratype), 2655 (paratype), 2773–2778 (paratypes); 5 km E Chota on Panamerican Highway, 00°28' N, 78°01' W, QCAZ 2768 (paratype), 3755 (paratype), 3757 (paratype), 3762–3767 (paratypes), 3769–3776 (paratypes), 3768 (holotype); Salinas, 00°30' N, 78°08' W, QCAZ 4162; Tumbabiro, 00°28' N, 78°12' W, QCAZ 4161; surroundings of Yaguarcocha, EPN 5848 (paratype).

Stenocercus festae (55 specimens)

Provincia Azuay: Cuenca, 02°53' S, 78°59' W, 2530 m, UDAR 11; 4 km E Cuenca, 2540 m, KU 134574–134579, 134582, 134583, 134585–134592, 134594; Laguna Zurucuchu, 3200 m, KU 121094; 3.1 km E Sigsig on road Sigsig-Shuso, Río Santa Bárbara, 2450 m, QCAZ 3789; 4 km W San Cristóbal, 2500 m, KU 121095; Sevilla de Oro, 02°48' S, 78°39' W, 2630 m, QCAZ 4059 (neotype); Sigsig-Shiguinda road, 3200 m, QCAZ 1337; Ucubamba, 02°52' S, 78°54' W, 2530 m, UDAR 5; no specific locality, USNM 201222, 201223. *Provincia Cañar*: 3 km S Azogues, 2500 m, KU 134602, 134604–134607, 134609; Cañar, 02°33' S, 78°56' W, QCAZ 1409; La Carbonería, 02°30' S, 79°01' W, QCAZ 3117; Laguna Culebrillas, 02°25' S, 78°51' W, QCAZ 1346–1348; Cebadas, Pacupala, EPN 2700. *Provincia Loja*: Chuquiribamba, 03°50' S, 79°20' W, 2700 m, QCAZ 1340; Manú, 03°29' S, 79°24' W, 2200 m, QCAZ 3599–3602; Saraguro, 03°36' S, 79°13' W, 2500 m, KU 134120, 134122–134126, QCAZ 3113; 14 km NE Urdaneta, 3050 m, KU 179419.

Stenocercus guentheri (77 specimens)

Provincia Chimborazo: 14.5 km N Tixán on Panamerican Highway, 3200 m, QCAZ 3659–3661. *Provincia Cotopaxi*: near Panamerican Highway on the Cotopaxi National Park, 3200 m, FHGO 629; Cotopaxi National Park, approx. 4000 m, QCAZ 1109. *Provincia Imbabura*: Atuntaqui, 2387 m, QCAZ 776; 7,5 km N Otavalo on Panamerican Highway, QCAZ 3761; Tabacundo-Mojanda road, 3150 m, QCAZ 3793. *Provincia Pichincha*: Cayambe, SMF 11162; Cayambe volcano, 3500 m, FHGO 1136; Guayllabamba, 2139 m, QCAZ 718, 777, 779, 782; Ilaló, Hacienda Chuspiyacu, QCAZ 722; Illiniza Sur, QCAZ 730; Jerusalem, 2578 m, QCAZ 1323; Lloa, 00°15' S, 78°35'W, 3060 m, QCAZ 4108; Machachi, 2940 m, QCAZ 720, 736, 758, 775, 778, 780, 781, 783, 784; Pintag-Antisana road, 2880 m, QCAZ 2808; Pusuquí, QCAZ 4108; Quito, 2810 m, EPN 5900, QCAZ 432, 728, 737, 2857, SMF 60592; San Antonio, 00°01' S, 78°27' W, QCAZ 713–716, 738, 740–754, 1357, 1400, 2163, 2199, BM 58.7.25.16, 58.7.25.16a, 58.7.25.18, 59.9.20.6, 60.6.16.18, 60.6.16.20–21 (syntypes); Uyumbicho, QCAZ 760. *Provincia Tungurahua*: Ambato, 01°15' S, 78°37' W, 2575 m, EPN 5898, 5899; Picaihua, EPN 5887–5889; Urbina, QCAZ 2858; no specific locality, FHGO 522, 852, 1493, SMF 53199.

Stenocercus haenschi (1 specimen)

Provincia Bolívar: Balsapamba, 01°47' S, 79°10' W, 750 m, ZMB 16595 (holotype).

Stenocercus humeralis (42 specimens)

Provincia Loja: Catamayo-Jimbilla road, EPN 5824–5843; Loja, 04°00' S, 79°12' W, 2064 m, BM 1946.8.11.76 (syntype), EPN 1343, 5807, 5808, 5810–5813, 5815, FHGO 1494, 1495, KU 121136, 121138, 134000, 134002; 5 km N Loja, 2150 m, KU 134003, 134005; 2 km E Loja, 2200 m, KU 121137; 2.7 km E Loja, 2135 m, KU 141162; 12.2 km S Loja on road to Vilcabamba, 2275 m, KU 141163; Malacatos, EPN 1270, 5809.

Stenocercus iridescens (42 specimens)

Provincia Azuay: Tamarindo, FHGO 416. *Provincia Cotopaxi*: La Maná, 00°56' S, 79°13' W, 300 m, QCAZ 2767, 3052. *Provincia El Oro*: 15 km E Pasaje on road Pasaje-Pan de Azúcar, 90 m, QCAZ 3620; Piñas, 03°41' S, 79°41' W, 1410 m, FHGO 1089. *Provincia Esmeraldas*: Atacames, 00°52' N, 79°50' W, 8 m, EPN 5909; La Unión, 00°49' N, 79°51' W, 10 m, FHGO 97; Río Tiaone EPN 5906, 5908; Same, 00°51' N, 79°54' W, 0 m, QCAZ 721; Tonsupa, 00°53' N, 79°45' W, 0 m, QCAZ 762, 763, 804, 805. *Provincia Guayas*: Balzar, 01°22' S, 79°54' W, 37 m, EPN 5925–5927, 5929–5931, QCAZ 735; Cerro Blanco, EPN 5005, 5007–5009. *Provincia Los Ríos*: Centro Científico Río Palenque, 00°35' S, 79°22' W, QCAZ 431, 2205, 2206, 2212; Jauneche, EPN 5004; Patricia Pilar, 00°33' S, 79°22' W, QCAZ 97; Ventanas, 01°27' S, 79°27' W, QCAZ 1655. *Provincia Manabí*: Cabo Pasado, 00°22' S, 80°29' W, 20 m, QCAZ 3322; Cerro San Sebastián, EPN 5014; Puerto Rico, 01°38' S, 80°49' W, 12 m, QCAZ 1634; 27 km N San Vicente on road San Vicente-Pedernales, 00°22' S, 80°26' W, 50 m, QCAZ 3329, 3330, 3343; 32 km N San Vicente on road San Vicente-Pedernales, 00°20' S, 80°21' W, 183 m, QCAZ 3314. *Western Ecuador*: BM 60.6.16.2–4 (syntypes).

Stenocercus ornatus (41 specimens)

Provincia Loja: Catamayo, 2280 m, KU 141167; Cerro Uritusinga, 3000 m, QCAZ 2020; Cerro Villonaco, EPN 3540; Loja, 04°00' S, 79°12' W, 2064 m, KU 121126; 4.6 km N Loja, 2065 m, KU 141168-141170; 5 km N Loja, KU 134150, 134151, 134153, 134154; 2 km E Loja, 2200 m, KU 121127, 121129–121134; 6 km S Loja on road Loja-Vilcabamba, 2300 m, FHGO 585; 3 km W Loja, 2150, KU 134127, 134129–134131, 134134, 134138, 134139; 12 km W Loja, KU 134148; 15 km W Loja, KU 134140–134144, 134149; 10.6 km S Yangana, 2190 m, QCAZ 3790; Vilcabamba, 1500 m, FHGO 405, 679, 1161; no specific locality, EPN 5877–5880.

Stenocercus rhodomelas (32 specimens)

Provincia Azuay: 4.8 km W Abdón Calderón, 1435 m, KU 152183; 1.1–2.7 km SW Cataviña, 1310 m, KU 152188; 2.7–3.5 km SW Cataviña, 1250 m, KU 152185, 152187; 5 km S Nabón on road Nabón-San Isidro, 03°20' S, 79°04' W, UDAR 10; Oña, BM 1946.8.29.77–78 (syntypes); N Oña, 1885 m, KU 141164, 141166; 50.5 km E Pasaje, 730 m, KU 152177; Río León, 11.8 km N Buenos Aires, 1940 m, KU 202945, 202946; Río León, 12.5 km N Oña, 1920 m, KU 142699–142701; 1.6 km W Minas at Río Minas, 1410 m, KU 152178, 152179; Santa Isabel, 03°16' S, 79°19' W, QCAZ 3076; Valle de Yunguilla, Chalcápac, 1550 m, QCAZ 3663. *Provincia Loja*: Valle de Casanga, EPN 5910–5921.

Stenocercus simonsii (1 specimen)

Provincia Azuay: Oña, 6500 ft (1981.2 m), BM 1946.8.11.73 (syntype).

Stenocercus varius (25 specimens)

Provincia Cotopaxi: Peñas Coloradas, QCAZ 1695; Reserva Integral de Bosque Nublado Otonga, 00°44' S, 78°59' W, 2000–2200 m, QCAZ 3118, 3845; San Francisco de las Pampas, 00°26' S, 78°57' W, QCAZ 86–91, 2015. *Provincia Pichincha*: Estación Forestal La Favorita, 00°14' S, 78°46' W, 1900 m, FHGO 354, 412, 424, 445; Reserva Florística Ecológica Río Guajalito, 00°14' S, 78°48' W, 1840 m, QCAZ 717, 719, 1334, 3046, FHGO 337; Río Blanco, EPN 5932; Tandapi, 00°25'S, 78°47' W, 1460 m, QCAZ 590, 591, 593–596.

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